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# Crisis Stability and Long-Range Strike

A Comparative Analysis of Fighters,  
Bombers, and Missiles

Forrest E. Morgan





PROJECT AIR FORCE

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Prepared for the United States Air Force

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## Preface

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The U.S. Air Force recently faced a decision milestone on whether to continue research and development for a new-generation penetrating bomber that would be a follow-on to the B-2 Spirit. To inform this decision, it asked RAND Project AIR FORCE several questions, one of which was whether penetrating bombers would be important for maintaining stability should the United States find itself in a confrontation with a nuclear-armed state.

To answer this question, the author developed an analytical framework for measuring and comparing the alternative strike systems that could contribute to crisis management and crisis stability. RAND researchers applied this framework to gather and analyze the necessary data, and the lead researcher briefed Air Force leaders on the findings. The analysis indicated that long-range strike assets play an important role in crisis management. More importantly, penetrating bombers have attributes needed for stabilizing international crises in degrees not provided by other strike assets.

While the findings of this “quick-turn” analysis were informative, they were preliminary and more work remained to be done. This report presents the results of that follow-on work. To validate the attributes used in the preliminary analysis, this report explores the nature of international crises, the principles of crisis management, and the ways in which military force structure affects crisis stability. It then refines the attribute analysis previously done and corroborates its findings in an examination of 48 international crises that have occurred since World War II.



The research reported here was sponsored by the Office of the Vice Chief of Staff, Air Force Quadrennial Defense Review, Headquarters U.S. Air Force and conducted within the Strategy and Doctrine Program of RAND Project AIR FORCE.

This report will be of interest to analysts involved with strategic planning and war-gaming, scholars and students engaged in research on historical cases of crisis management and crisis stability, and military personnel involved in decisions about the allocation and use of the types of strike systems examined here.

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## Summary

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Crisis stability can be described as the degree to which mutual deterrence between dangerous adversaries can hold in a confrontation. Crisis stability and the means of achieving and maintaining it—crisis management—are not about warfighting. They are about building and posturing forces in ways that allow a state, if confronted, to avoid war without backing down.

These topics have received little attention since the end of the Cold War, but nuclear proliferation and the reemergence of great power competitors will make dangerous interstate confrontations increasingly likely in the future. When managing these crises, U.S. leaders will need to defuse the threat of war without compromising important political or military interests. They will prefer to do so while the confrontation remains at a conventional level, before tensions escalate and one or both sides resort to nuclear brandishing. In such situations, crisis management will require balancing threats with restraint while limiting each side's vulnerability to surprise attack. Long-range strike assets—strike fighters, bombers, ballistic missiles, and cruise missiles—will play an important role.<sup>1</sup> The question is, however, whether any of these systems are more conducive to crisis stability than others and why.

---

<sup>1</sup> Although cyber warfare capabilities can also strike quickly and from afar, they were not included in this analysis because crisis stability and crisis management rely heavily on deterrence and signaling. To be effective, both of those functions require the ability to threaten in ways that are visible, tangible, and credible to the opponent. Cyber attacks *might* create significant effects in future conflicts, but the substance and potency of those effects are as yet unproven to potential adversaries. Given these uncertainties and the substantial differences

## Approach and Methodology

To answer this question, this report draws from the prominent works in the field to illuminate the nature of international crisis, the principles of crisis management, and the relationships between force structure and crisis stability. From these insights, it identifies which attributes are desirable in strike assets and presents an analytical framework to evaluate the degree to which various strike systems exhibit those attributes.

The report then applies this framework to an evaluation of the relative strengths and risks of posturing several alternative strike systems in an effort to stabilize a notional military confrontation with a dangerous regional opponent in the 2025–2030 time frame. The systems analyzed are strike fighters (F-35s), legacy bombers (B-52s and B-1s) with standoff weapons, future penetrating bombers (B-Xs),<sup>2</sup> and conventionally armed intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and sea-launched cruise missiles (SLCMs). The findings of this analysis are then used to generate a set of propositions regarding these systems' potential influences on stability during a crisis and their utility as tools of crisis management. The report then tests these propositions against the historical record in a survey of how strike asset postures influenced the outcomes of 48 international crises since the end of World War II. Finally, it integrates the findings of these analyses and puts them into perspective.

## Study Findings

### Importance of Force Structure in Crisis Management and Stability

Crisis management is largely about strategy, but force structure is also important. Efforts to manage a crisis can be undermined if the

---

between kinetic and cyber warfare, the latter's potential effects on crisis stability should be evaluated in a separate study.

<sup>2</sup> Because future penetrating bombers have not yet been designed, the study used notional bombers with B-2 range and payload specifications as a proxy for these aircraft, which is why B-2s were not evaluated separately. See Appendix B for more on the methods used in the attribute analysis of alternative strike systems.

underlying structure of the geopolitical environment is unstable. Military forces are an important part of that structure, either bolstering or eroding its stability. They are among the principal tools to which national leaders turn in efforts to manage international crises. It is critical to emphasize at this point that the objective of crisis management is to achieve and maintain stability: It is more about deterrence than warfighting.<sup>3</sup> While all military forces contribute to deterrence, long-range strike systems are especially important because they can be brought to bear more quickly than other forces and can pose deterrent threats from afar. The RAND study identified three attributes that air and missile strike systems need to strengthen structural stability and three others that make them effective tools of crisis management.<sup>4</sup>

### **Structural Stability Attributes**

To bolster structural stability, strike assets should have the following characteristics.

#### ***They Should Be Sufficiently Potent to Deter a Conventional Attack***

Deterrence is the foundation of structural stability. Because nuclear threats may lack credibility in the face of conventional aggression, and because U.S. leaders will want to stabilize crises well below the nuclear threshold, potent conventional strike assets must be available to posture during an international crisis.

---

<sup>3</sup> This does not suggest that warfighting capabilities are not important considerations in crisis management. As discussed later, crisis management requires both conventional and nuclear deterrence, which requires posturing forces in ways that cause an opponent to doubt that it could succeed with a conventional attack. U.S. leaders will also need to be prepared to fight, manage escalation, and prevail in war should crisis management fail. Nevertheless, the political and military objectives of crisis management center on deterring wars with nuclear-armed opponents and some conventional opponents—wars that would be so costly that national leaders would prefer to avoid them if they can do so without surrendering important U.S. interests.

<sup>4</sup> This report explores, among other things, the concept of “structural stability.” Structural stability is determined by preexisting conditions in the strategic environment, such as geography, political relationships, and force structure (e.g., size, composition, disposition, technology, doctrine), which, in turn, contribute to or detract from stability when a crisis arises.

***They Should Be Able to Minimize U.S. Vulnerability to Surprise Attack***

If posturing forces to project a deterrent threat requires making them vulnerable to a surprise attack, then a risk-tolerant opponent might be tempted to launch a preemptive strike. Structural stability requires forces that are powerful enough to deter a potential enemy but employable in ways that minimize their exposure to surprise attack.

***They Should Be Able to Mitigate the Threat of U.S. Surprise Attack***

This attribute is counterintuitive. Surprise has always been a highly valued means of achieving tactical objectives in war, but crisis management is not war. During an international crisis, posturing powerful strike forces in a way that suggests that a surprise attack is imminent can lead an opponent to conclude that it has no alternative but to launch a preemptive strike. Therefore, structural stability requires forces that can be postured to impose a potent deterrent threat while mitigating—*though not completely eliminating*—the peril of U.S. surprise attack.

**Crisis Management Attributes**

Important as it is, structural stability is only a prerequisite to effective crisis management. Once in a confrontation, U.S. leaders will want to do more than simply deter the aggressive ambitions of other states. They will want to defuse the crisis on terms that are favorable to U.S. interests. This will require strategies that apply coercive pressure on opponents, as well as the forces to execute those strategies. Strike assets will need the following attributes.

***They Should Be Flexible***

Strike assets should have utility in a wide variety of scenarios, and they should bring a broad selection of employment profiles to each scenario.

***They Should Be Responsive***

Since crises can erupt suddenly in distant places, strike assets must be capable of prompt alert, deployment, and employment. Furthermore, because crisis management is as much a political function as a military one, the military tools employed to support it should have the ability

to modulate their operating tempo in coordination with diplomatic actions.

### ***They Should Offer Capabilities for Signaling***

Strike assets need to be employable in ways that visibly communicate a nation's capability, resolve, and restraint. In other words, they need the ability to signal a determination and ability to prevail should the crisis devolve to war with a willingness to allow time to seek a negotiated settlement.

### **Strengths and Risks of Alternative Strike Systems**

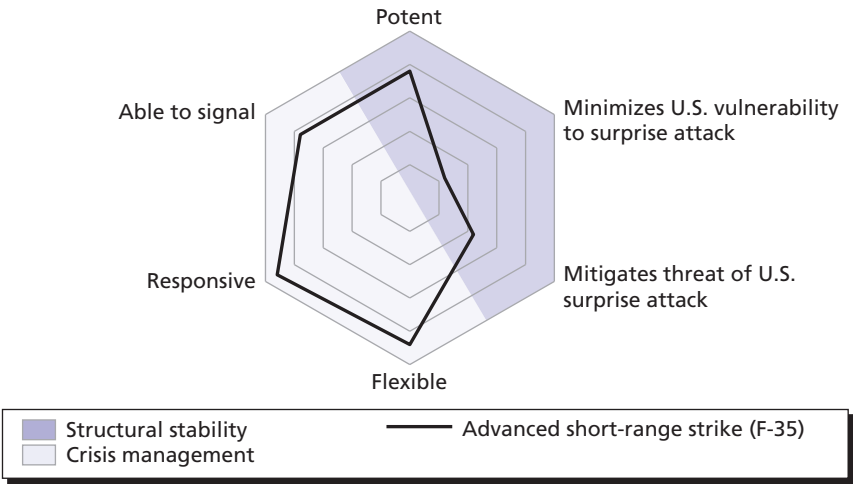
Evaluating the attributes of alternative strike systems and validating those findings against the historical record led to the following insights.

#### ***Short-Range Strike Can Be Dangerously Destabilizing***

Strike fighters can generate a potent deterrent threat. When based close to enemy targets, they can deliver high volumes of conventional ordnance in short periods of time. In 12 of the 15 cases examined in which conventional confrontations were effectively managed, the victims of aggression or the states intervening to defend those victims brandished aircraft to stabilize the crises. In all cases, states postured short-range strike fighters close to their opponents, either at land bases or on aircraft carriers, to generate the potency needed to deter the aggressors. This approach has worked well in the past because the state or states brandishing aircraft (the United States was usually the central actor) have enjoyed the luxury of confronting adversaries that largely lacked the capabilities to strike the bases and aircraft carriers on which the aircraft were being postured. In essence, the defenders reaped the benefits of long-range strike even when posturing only short-range strike assets. Unfortunately, that era may be coming to an end.

With the proliferation of space, missile, and precision-guided munition technology, future opponents confronting the United States are likely to have sizable arsenals of precision-guided ballistic and cruise missiles able to accurately target air bases and aircraft carriers at ever increasing ranges. Figure S.1 illustrates the structural instability that

**Figure S.1**  
**The Structural Instability That Results from Close Basing**



RAND MG1258-S.1

would result from posturing strike assets close to opponents with these capabilities.<sup>5</sup>

In the 2025–2030 scenario examined here, close-based F-35 advanced strike fighters were able to pose a potent threat to the opponent. They generated high sortie rates and, when refueled just outside the surface-to-air missile threat envelope, held a considerable number of enemy targets at risk. However, posturing the U.S. strike force within range of a substantial portion of the opponent’s conventional missile forces made it highly vulnerable to enemy surprise attack. At the same time, the short distances from U.S. bases and carriers to enemy tar-

<sup>5</sup> This figure and those that follow are radar plots displaying scores attributed to alternative strike systems in each of the six aforementioned categories. The study team scored systems on a scale of 0 to 25 points for each attribute. Each plot is a six-dimensional graph marked off in five-point increments from the center out. That is, the inner ring connects the five-point markers on all six dimensions, and the outer ring connects the 25-point markers. Point values are not displayed on the rings because the numbers are not important in any absolute sense. What is important are the relative positions of each strike system’s scores compared with the scores of other strike systems. For more on the analytical methods used and the actual factored scores of each strike system, see Appendix B.

gets resulted in short warning times for enemy forces and compressed decision times for enemy leaders—in other words, a substantial threat of U.S. surprise attack. This combination of high threat and mutual vulnerability would invite enemy preemption, making it difficult to stabilize the crisis.

The case-study analysis corroborated this finding. Although the United States has been able to safely posture short-range strike aircraft close to opponents in multiple crises, other states were not so fortunate. Confrontations between Israel and its hostile Arab neighbors have demonstrated the dangers of close basing, the most notable examples being the 1967 Arab-Israeli crisis and the 1973 Yom Kippur crisis. In both cases, powerful air forces based close to each other (due to the region's political geography) created a crucible of instability that exploded in surprise attacks. The 1971 Bangladesh crisis, which culminated in a Pakistani preemptive air strike on 15 Indian air bases, exhibited some of the same dynamics.

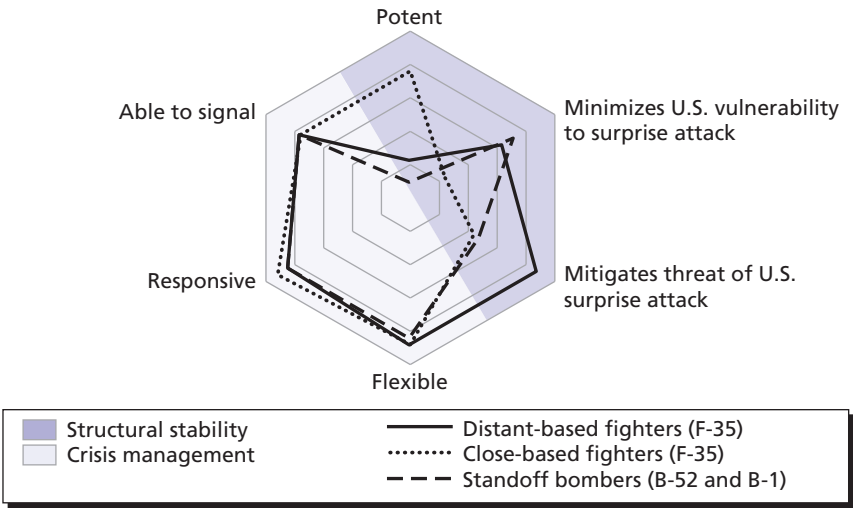
***Neither Adding Legacy Bombers with Standoff Weapons nor Moving Fighters Back Solves This Problem***

Options examined for dealing with this problem included supplementing close-based strike fighters with legacy bombers armed with standoff weapons and moving strike fighters to more distant bases, but neither of these approaches offered a reliable solution. Figure S.2 illustrates the dynamics that these options create.

Distant-based legacy bombers would be safer from surprise attack, but, due to limitations in the number of standoff weapons available, they would not be very potent. Nor would adding them to the equation reduce the vulnerability of the close-based strikers. Since that is where the potent threat would reside, that is where the opponent would most likely focus a preemptive attack. As Figure S.2 indicates, moving the strike fighters back would reduce their vulnerability as well as the threat they present of U.S. surprise attack, but it would also drive down sortie rates, substantially reducing their potency. Seeing that posture, even in combination with standoff bombers, an aggressive, risk-tolerant opponent might attack a regional friend of the United States, doubt-



**Figure S.2**  
**Strike Fighters Supplemented by Bombers with Standoff Weapons**



RAND MG1258-S.2

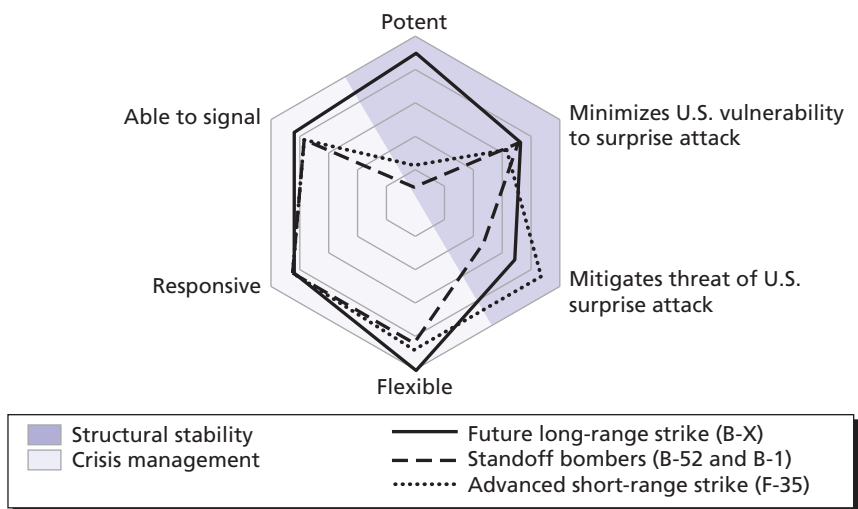
ing that U.S. strike forces could provide adequate firepower to defeat it from afar.

***Penetrating Bombers Offer Potency Without Excessive Vulnerability***

Penetrating, long-range bombers (i.e., aircraft with sufficient range and payload to operate effectively from distant bases and with sufficient passive and active defenses to survive in the opponent's defended airspace) offer one possible solution to this dilemma.

As Figure S.3 illustrates, penetrating bombers generate a potent deterrent threat without exposing U.S. forces to an inordinate amount of vulnerability to surprise attack. Distant basing also mitigates the threat of U.S. surprise attack. With their stealthy characteristics and deep reach into the opponent's defended airspace, future penetrating bombers would present a greater threat of surprise attack than strike fighters operating from the same ranges, but U.S. leaders could manage this threat by coordinating tactics within a broader crisis man-

**Figure S.3**  
**Penetrating Bombers, Distant-Based Strike Fighters, and Standoff Bombers**



RAND MG1258-S.3

agement strategy.<sup>6</sup> Substantial numbers of standoff and penetrating bombers could be deployed to regional bases to generate a deterrent threat but kept well away from the opponent's defended airspace to mitigate the threat of surprise attack. Should U.S. leaders decide to intensify the threat, bomber patrols could be moved closer to the opponent or increased in number and frequency. Given the flexibility and responsiveness inherent in airpower, bombers would give U.S. leaders the ability to modulate threats to send the signals needed in carefully nuanced crisis management strategies.

### ***Aircraft Are Excellent Tools of Crisis Management, but Sub-Surface Missiles Are Not***

As Figure S.3 also indicates, all the aircraft types examined in this study proved to be well endowed with the attributes needed to be effective tools of crisis management. Aircraft excel in flexibility, respon-

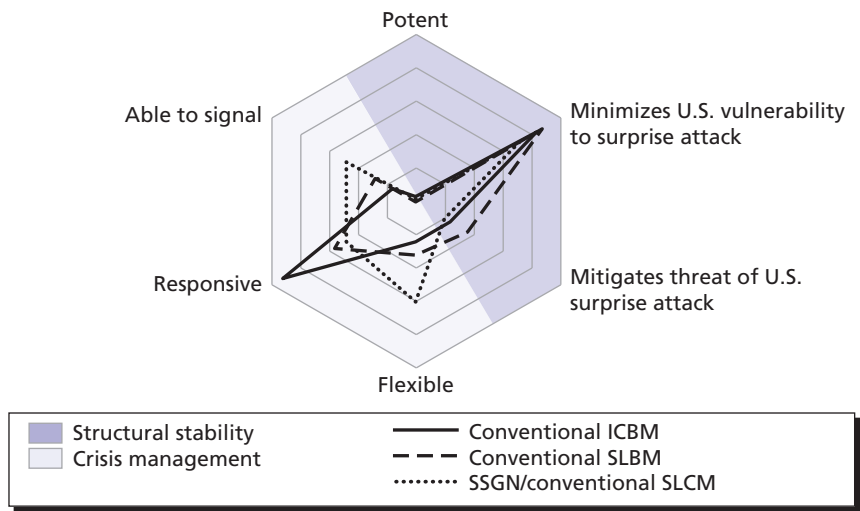
<sup>6</sup> The analysis assumed that the next generation of penetrating bombers would have advanced active and passive defenses, making them stealthier than B-2s and considerably stealthier than F-35s.

siveness, and the ability to signal. These capabilities allow them to be employed in a variety of operational profiles, making them useful across a wide range of scenarios. As a result, bombers and fighters offer crisis managers capable tools for signaling U.S. levels of concern and sending discernible messages to friends and opponents alike.

Sub-surface missiles are poor tools of crisis management, however. As Figure S.4 illustrates, although these missiles are responsive and relatively invulnerable to conventional surprise attack, their underground or submarine basing limits their flexibility and ability to signal.

All three sub-surface missile systems examined in this study were restricted in the range of scenarios in which they could be employed and the kinds of attacks and weapons effects they could create. Similarly, while the United States could signal concern during a crisis by flushing submarines from port or putting ICBMs on alert, little more could be done with these systems after that to send discernible messages to an opponent.

**Figure S.4**  
**Conventional Missiles: ICBMs, SLBMs, and SLCMs**



NOTE: SSGN = guided-missile submarine.

The case-study analysis corroborated these findings. In a significant number of the international crises surveyed, aircraft were brandished but missiles were not. In the cases in which missiles were brandished, it was usually in the form of raised defense readiness conditions to communicate nuclear threats, and bombers were usually brandished as well. Conventional missiles were rarely used to signal in international crises.

### **Cruise Missiles as Enablers of Other Crisis Management Tools**

In contrast to conventional ballistic missiles, cruise missiles—whether fired from aircraft or naval vessels—have demonstrated their utility in war. Due to the relationship between warfighting ability and conventional deterrence, these weapons also have important roles to play in structural stability and crisis management. But their principal value derives little from any independent contribution to deterrence. Inventory limitations on weapons delivered from all platforms and the inability to quickly reload weapons fired from submarines drive cruise missile potencies down to levels that make them unlikely to pose significant deterrent threats by themselves.<sup>7</sup> Rather, their ability to salvo against key targets in an opponent's integrated air defense system (IADS) endows them with an important enabling capability, amplifying the potency of penetrating aircraft. This dynamic, however, exemplifies the proverbial “double-edged sword.” If the aircraft projecting the principal threat are postured in a way that makes them vulnerable to preemption, the added threat of cruise missiles disabling the opponent's IADS will only increase the resultant instability. Conversely, if aircraft are postured to project a potent deterrent threat from positions that are safe from surprise attack, the cruise missile threat will heighten the strength of the deterrent, adding to structural stability.

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<sup>7</sup> This analysis used weapon inventory projections provided by Headquarters U.S. Air Force, Directorate of Operational Capability Requirements. Cruise missile inventory limitations were driven by the high costs of these weapons. For an analysis comparing these costs to those of penetrating bombers, see Thomas Hamilton, *Comparing the Cost of Penetrating Bombers to Expendable Missiles Over Thirty Years: An Initial Look*, Santa Monica, Calif.: RAND Corporation, WR-778-AF, 2011.

## Putting the Findings into Perspective

This study found that, considered individually, aircraft are the strike assets that offer decisionmakers the most flexible and responsive tools for crisis management, and long-range penetrating bombers are the strike assets able to contribute the most to structural stability. However, this analysis does not suggest that decisionmakers should acquire any single kind of strike asset exclusively—either for crisis management or for warfighting—or that they should posture or employ them individually to create desired effects. Nor does this report argue that decisionmakers should procure strike assets to the exclusion of other force elements, although it does point out that long-range strike can bring deterrent threats to bear from afar and more quickly in a crisis.

Crisis management and war are about strategy. In both cases, decisionmakers must marshal the means at their disposal and coordinate them in ways that achieve desired objectives. Military systems and forces do not operate independently in war, nor do opponents consider their potential effects independently when deciding whether to abide by deterrent threats or defy them. Orchestrated properly, force elements work synergistically, bringing the nation's power to bear to achieve its leaders' objectives in the most effective and efficient manner possible.

Therefore, this report does not suggest that penetrating bombers should constitute the nation's sole deterrent, conventional or nuclear. Nor does it imply that other strike assets or other force elements are not needed to perform missions aside from fighting wars, deterring wars, or managing crises. Ultimately, the nation will continue to need a suite of capabilities that operate in multiple domains to ensure its security.

That said, the analysis does indicate that long-range, penetrating bombers offer a combination of attributes that are important for stabilizing international crises, and these attributes are not exhibited as robustly by other strike assets. Since the end of World War II, bombers have been important arrows in the nation's quiver of force projection capabilities. They will likely remain so in the future.

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# Abbreviations

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ASBM	anti-ship ballistic missile
CONUS	continental United States
CSG	carrier strike group
DEFCON	defense readiness condition
DMZ	demilitarized zone
ExCom	Executive Committee of the National Security Council
IADS	integrated air defense system
ICBM	intercontinental ballistic missile
IRBM	intermediate-range ballistic missile
ISR	intelligence, surveillance, and reconnaissance
JASSM	Joint Air-to-Surface Standoff Missile
MAD	mutual assured destruction
MRBM	medium-range ballistic missile
NATO	North Atlantic Treaty Organization
NPT	nonproliferation treaty
PAF	RAND Project AIR FORCE

PGM	precision-guided munition
PLO	Palestinian Liberation Organization
PRC	People's Republic of China
ROC	Republic of China (Taiwan)
ROK	Republic of Korea
SAM	surface-to-air missile
SLBM	submarine-launched ballistic missile
SLCM	sea-launched cruise missile
SRBM	short-range ballistic missile
SSBN	ballistic missile submarine
SSGN	guided-missile submarine
TLAM	Tomahawk Land Attack Missile

## Introduction

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Crisis stability can be described as the degree to which mutual deterrence between dangerous adversaries can hold in a confrontation. Crisis stability and the means of achieving and maintaining that stability—crisis management—are not about warfighting. They are about building and posturing forces in ways that allow a state, if threatened, to avoid war without backing down.<sup>1</sup> Put another way, crisis stability is the degree to which adversaries at the brink of war do not feel pushed to attack first, either to seize a fleeting first-move advantage or for fear of having to absorb a crippling first strike from the enemy.<sup>2</sup>

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<sup>1</sup> As discussed later, crisis stability and crisis management concerns also apply in situations in which ongoing lower-level conflicts threaten to cross a major escalation threshold, such as the use of nuclear weapons or the threat of intervention by a major power. The 1973 Arab-Israeli confrontation is an example of a crisis that erupted in war. The Soviet Union's subsequent threat to intervene against Israel, which prompted the United States to put its forces at defense readiness condition (DEFCON) 3, signaling a nuclear threat, was also a crisis.

<sup>2</sup> According to a frequently quoted definition, it is "a measure of the countries' incentives not to preempt in a crisis, that is, not to attack first in order to beat the attack of the enemy." (See Charles L. Glaser, *Analyzing Strategic Nuclear Policy*, Princeton, N.J.: Princeton University Press, 1990, p. 45.) As explained in Chapter Two, the fear of surprise attack and the pressure it generates to limit damage by conducting a preemptive first strike are the two most prominent causes of crisis instability when confrontations approach the brink of nuclear war. In conventional crises, in which first strikes are not as potentially devastating, other factors, such as aggressive ambitions and apparent closing windows of opportunity, can also contribute to instability. Even in these cases, however, a perceived first-move advantage, whether to preempt an expected attack or to otherwise achieve an advantageous position in the opening phase of a war, is often the most proximate cause of stability failure. See Richard K. Betts, *Surprise Attack: Lessons for Defense Planning*, Washington, D.C.: Brookings Institution Press,

This report examines the potential effects of alternative long-range strike systems on crisis stability.

## **Crisis Stability and the Rise and Decline of Crisis Management**

Although confrontations between powerful states have occurred throughout history, the dynamics of crisis stability first received serious attention during the Cold War when the growth of nuclear arsenals raised the potential costs of a conflict between the superpowers to horrendous levels. Even then, the risks were not immediately recognized or understood. In the 1950s, U.S. leaders threatened to meet Soviet aggression with massive retaliation, then began considering how to win a limited nuclear war should deterrence fail. But the Cuban missile crisis was a threshold event, shocking leaders on both sides with how close the United States and Soviet Union had come to a nuclear exchange.

In the years that followed, most U.S. policymakers concluded that war with the Soviet Union would likely result in a catastrophic outcome for both belligerents, one in which victory could not be attained in any meaningful sense. That realization led them to the logical conclusion that defusing superpower confrontations would be preferable to fighting or even winning a nuclear war. Crisis management strategies were developed to deal with situations in which stability was preferable to Pyrrhic victory.

With the end of the Cold War, however, concerns about crisis stability quickly faded.<sup>3</sup> The Soviet Union had mellowed, and it soon disintegrated, leaving the United States as the sole remaining superpower. Although Russia inherited the former Soviet nuclear arsenal,

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1982, pp. 141–147; and Stephen Van Evera, *Causes of War: Power and the Roots of Conflict*, Ithaca, N.Y.: Cornell University Press, 1999, pp. 35–72.

<sup>3</sup> Historians and security analysts do not all agree on just when the Cold War ended. For the purposes of this discussion, I consider it to have officially ended on December 3, 1989, when President George H. W. Bush and Premier Mikhail Gorbachev issued a joint declaration to that effect at the close of the Malta Summit.

Moscow was then on good terms with Washington, and no other state had nuclear or conventional military capabilities that were comparable. This granted U.S. leaders more freedom than in any previous era to employ force in pursuit of the nation's interests. U.S. leaders have indulged in that freedom on several occasions over the past two decades, toppling regimes or intervening in conflicts on three continents. In none of those operations have U.S. leaders sought stability as an alternative to victory, because the costs of those wars were thought to be reasonable in exchange for the benefits expected. Indeed, when leaders conclude that war is affordable, it becomes a viable instrument of policy.<sup>4</sup>

## **Stability Concerns in the Emerging Strategic Environment**

There are reasons to believe that interstate wars will not be as affordable as we advance further into the 21st century. In fact, the risks in some confrontations may be comparable to what the United States experienced in the Cold War. Although the ideological struggle between Marxism and liberal capitalism has waned, major nuclear powers from the Cold War era still exist. Those states have interests, some of which are in conflict with those of the United States. Moreover, new nuclear-armed states have emerged, and proliferation trends indicate that more will appear over time. All the states that have joined the nuclear club since the end of the Cold War (or are soon to join it) have serious historical animosities with regional rivals, and some are embroiled in ongoing conflicts. Furthermore, several of them are openly hostile to the United States. As a result, there are multiple flashpoints around the periphery of Eurasia in which the United States could find itself in crises with nuclear near-peer competitors or drawn into conflicts with nuclear-armed regional powers. Even if such conflicts remain below the nuclear threshold, major conventional wars could also result in heavy

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<sup>4</sup> This is not to suggest that U.S. leaders deliberately entered the conflicts in which the United States is currently engaged. The long-term struggle with radical Islam was thrust upon the nation with the attacks of September 11, 2001. But as this chapter explains, wars with nonstate actors are mostly outside the purview of crisis management.

costs for the United States, and the risks of escalation would be serious. As a result, the need for effective crisis management remains and will only grow in the coming years.

This does not suggest that U.S. leaders will seek crisis stability in confrontations with every opponent. Weak conventional states can often be persuaded or coerced to change their behavior when it threatens U.S. interests. Failing that, they can usually be affordably defeated, as several post–Cold War conflicts have demonstrated. Crisis management will not be needed in these cases. Nor will it be applicable in conflicts with nonstate actors for two reasons: First, such adversaries do not trigger crises of the type or magnitude addressed in crisis management. Although conflicts with insurgents, terrorists, and criminal groups may generate crises of sorts, they do not create the levels of immediate national peril that arise in confrontations at the brink of war with powerful states, particularly those with nuclear weapons. Second, conflicts with nonstate actors cannot be managed in the same way as confrontations between states because such actors usually do not respond to threats, assurances, and inducements—the diplomatic levers that national leaders manipulate to stabilize interstate crises. These attributes make nonstate actors the targets of strategies featuring preemption, defeat, and apprehension, as opposed to those aimed at crisis management.

Nevertheless, a growing number of nuclear-armed states are present in the contemporary strategic environment. These states have capabilities to inflict serious costs on the United States in war, even in wars that the United States would ultimately win. When confrontations occur with these states, U.S. leaders will need to safeguard national interests, but they will prefer to do so without paying the onerous costs of war. So, the central problem they will face in such crises is how to posture U.S. forces to best secure those interests without provoking any of a wide variety of potential nuclear-armed adversaries—some aggressive and risk-tolerant, others fearful and reactionary—into attacking preemptively. Cold War strategies for managing the tension between issuing threats and avoiding preemption entailed engaging in games

of brinkmanship.<sup>5</sup> But the inherent dangers of such approaches were unattractive to national leaders even then, when the strategic environment was characterized by two superpowers that were largely symmetrical in their nuclear capabilities and levels of risk tolerance. U.S. leaders will be even more averse to bargaining at the brink of nuclear war in today's world, where potential adversaries are less predictable. Rather, they will prefer to stabilize future crises at conventional levels of confrontation, before tensions escalate to the point at which nuclear brandishing occurs. In any case, crisis management will remain the preferred strategy for protecting national interests while avoiding wars in which victory would be prohibitively costly.

## **The Role of Force Structure and the Purpose of This Study**

Crisis management is largely about strategy, but force structure is also important. When U.S. leaders find themselves at the brink of war with a dangerous state, they will seek to stabilize the crisis without surrendering the interest that led to the confrontation. That will require a diplomatic strategy incorporating clearly communicated threats, balanced with restraint and assurances that the opponent need not attack first for fear of U.S. preemption while the parties work to resolve the crisis.

This suggests a requirement for military forces with particular attributes. Just as war is a continuation of policy by other means, crisis diplomacy without a threat of force is impotent. Yet, the forces that embody the substance of that threat must not only be powerful, they must be subject to restraint and modulation in harmony with the ebb and flow of diplomatic developments. Indeed, changes in force posture will sometimes be the means by which implicit threats and assurances

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<sup>5</sup> Brinkmanship in crisis management is a form of coercive bargaining in which opponents manipulate the shared risk of war, each trying to force the other to back down by pushing the confrontation close to the brink of war and raising fears that events might spin out of control, dragging both to destruction. Thomas Schelling is most noted for developing the theoretical basis of this concept. See Thomas C. Schelling, *Arms and Influence*, New Haven, Conn.: Yale University Press, 1966, pp. 99–105.



are communicated. Furthermore, they must not impose a threat that appears so dire and imminent that the opponent sees no alternative but to attack first to limit the damage inflicted upon it. The difficulty of balancing these peculiar, seemingly contradictory, requirements led to the need for this study. The study sought to determine which strike assets offer the best combination of force structure attributes to enable national leaders to posture forces in ways that are most conducive to stabilizing crises and securing U.S. interests.<sup>6</sup> Specifically, it aimed to answer the following questions:

1. What is the fundamental nature of interstate crises, and by what means can U.S. leaders manage confrontations between powerful states to maintain or restore crisis stability? How are the dynamics of crisis stability evolving with changes in the geopolitical environment?
2. Do strike systems (strike fighters, bombers, ballistic missiles, and cruise missiles) possess any particular attributes that make them more or less conducive to crisis stability. That is, do they have attributes that contribute to *structural stability*, and do their attributes make them or more or less effective as tools for crisis management?<sup>7</sup>
3. How do alternative strike systems compare in terms of structural stability and crisis management attributes?

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<sup>6</sup> Here, I wish to point out the subtle but important difference between the terms *force posture* and *force structure*. Because actions speak louder than words, national leaders will need to posture forces in ways that communicate the delicate balance of threat, restraint, and assurance needed to manage crises effectively. But posturing forces to communicate such messages is difficult in the best of situations and impossible if the forces at their disposal lack assets with the attributes needed to do so. This study sought to identify those attributes and determine the extent to which alternative strike assets exhibit them to inform force structure decisions.

<sup>7</sup> Readers might wonder why cyber warfare capabilities were not among the strike assets examined in this analysis, since they too can strike quickly and from afar. It is because crisis stability and crisis management rely heavily on deterrence and signaling. To be effective, both of those functions require the ability to threaten in ways that are visible, tangible, and credible to the opponent. Cyber attacks *might* create significant effects in future conflicts, but the substance and potency of those effects are as yet unproven to potential adversaries.

## Organization and Approach

To answer these questions, this report draws from the prominent works in the field to explain, in Chapter Two, the nature of international crisis, the principles of crisis management, and the relationship between force structure and stability. Applying these insights, it then identifies which structural stability and crisis management attributes are desirable in strike assets. Building on that foundation, Chapter Three presents an analytical framework based on these attributes and uses it to evaluate and compare several alternative strike systems in terms of which should be most conducive to structural stability and which should offer the most utility as tools of crisis management. Chapter Four features a focused analysis of 48 cases to determine whether the historical record provides evidence in support of the conclusions reached in Chapter Three. Chapter Five summarizes the findings of this work and puts them into perspective.

The report also includes three appendixes. Appendix A provides fuller accounts of the two international crises summarized in Chapter Two: the 1914 July crisis in the lead-up to World War I, and the 1962 Cuban missile crisis, which marked the height of Cold War tensions. Appendix B explains the methodology used in the attribute analysis in Chapter Three, and it provides details on the scoring of each strike system's attributes. Appendix C explains the methods used in selecting the historical cases and conducting the analysis reported in Chapter Four, and it includes a table of raw data collected on each case.

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Given these uncertainties and the substantial differences between kinetic and cyber warfare, the latter's potential effects on crisis stability should be evaluated in a separate study. For an insightful analysis of the strengths, problems, and uncertainties surrounding cyber deterrence and cyber warfare, see Martin C. Libicki, *Cyberdeterrence and Cyberwar*, Santa Monica, Calif.: RAND Corporation, MG-877-AF, 2009.



## **Crisis Management, Crisis Stability, and Force Structure**

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This chapter examines the relationships between crisis management, crisis stability, and force structure. It begins with a discussion on the nature of international crises using synopses of the 1962 Cuban missile crisis and the 1914 July crisis to illustrate the dynamics that can emerge in confrontations between powerful states. Then, it introduces the concept of crisis management and examines seven operational principles established at the end of the Cold War for guiding the development of crisis management strategies. However, as the illustrative cases reveal, stabilizing an international crisis is difficult in the best of conditions, and crisis management can be fatally undermined if serious structural instabilities are present. With this in mind, the chapter explains the role of military force structure in crisis stability and identifies the attributes that are desirable for strike assets to best contribute to structural stability and support crisis management.

### **The Nature of International Crises**

Powerful states have confronted one another many times in modern history. These incidents are typified by a sudden rise in tensions, causing national leaders to worry that war may be close at hand, or by a sudden concern that a small conflict may be approaching a serious escalation threshold, such as great power intervention or the use of nuclear weapons. In such cases, each actor's intentions, capabilities, and immediate actions are often difficult for others to discern, creating perceptions that the time available for critical decisionmaking is

limited and conditions could deteriorate quickly, putting leaders at a serious disadvantage if they do not act. As a result, there is a substantial risk of miscalculation and catastrophic accident. Security scholars, analysts, and practitioners refer to such events as *international crises*.<sup>1</sup>

An international crisis occurs when some event causes or aggravates a conflict of interests between states, resulting in a confrontation from which neither side is willing to back away, at least initially. Indeed, if one party to a dispute were unwilling to confront the other for fear of war, there would be no crisis. Similarly, when a principal abandons its interests, or the most powerful belligerents agree to a compromise, the crisis is averted, although not always for the greater good or lasting satisfaction of all parties, as the outcome of the Sudetenland crisis illustrates.<sup>2</sup> As Alexander George explains, it is “the tension between these two objectives—protection of one’s interests and avoidance of measures that could trigger undesired escalation—[that] creates a dilemma that is the basic challenge policy makers engaged in crisis management must try to resolve.”<sup>3</sup>

When one thinks of international crises, those of the Cold War often come to mind. The Suez crisis, the Berlin blockade, and, especially, the Cuban missile crisis punctuate our memories because they involved confrontations between the superpowers that could easily have plunged the world into wars in which nuclear weapons might have been used. Yet, it is important to remember that the world was no stranger to crisis before the nuclear age. The European powers experienced at least eight international crises in the first four decades of the

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<sup>1</sup> The characteristics of international crises mentioned here are drawn from Richard Ned Lebow, *Between Peace and War: The Nature of International Crises*, Baltimore, Md.: Johns Hopkins University Press, 1984a, pp. 7–12.

<sup>2</sup> The Sudetenland crisis began in March 1938 when Adolf Hitler incited Germans living in western Czechoslovakia to demand autonomy from Prague and promised to defend them from suppression by Czech government forces. The crisis was resolved that September, when Britain and France, in an effort to avoid war, accepted the Sudetenland’s cessation from Czechoslovakia and its annexation by Nazi Germany.

<sup>3</sup> Alexander L. George, “A Provisional Theory of Crisis Management,” in Alexander L. George, ed., *Avoiding War: Problems of Crisis Management*, Boulder, Colo.: Westview Press, 1991b, p. 23.

20th century, including the 1914 July crisis that propelled them into a war that ultimately cost the world 16 million lives.<sup>4</sup> Nor has the end of the Cold War heralded a new era of interstate harmony. India and Pakistan have stumbled into three major crises since becoming nuclear powers in 1998, the second of which devolved into nuclear brandishing so strident that the United States and the United Kingdom evacuated nonessential personnel from their embassies in Islamabad and New Delhi.<sup>5</sup>

## The Dynamics of International Crisis: Two Illustrative Cases

To appreciate how international crises erupt and the dynamics that can emerge as they unfold, it is helpful to review synopses of two cases from the 20th century: the 1962 Cuban missile crisis and the 1914 July crisis.<sup>6</sup> The Cuban missile crisis was a confrontation between nuclear-armed superpowers at the height of the Cold War. Given the immense stakes for both sides and the fact that it was resolved without the parties resorting to war, it was this episode that focused U.S. leaders' attention on the importance of crisis stability and spurred national security

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<sup>4</sup> Other European crises include the first Moroccan crisis in 1904–1906, the Bosnian crisis in 1908–1909, the Agadir crisis in 1911, the Aaland crisis in 1918, the remilitarization of the Rhineland in 1936, the Anschluss (union) of Austria and Germany in 1938, and the Sudetenland crisis in 1938.

<sup>5</sup> The three Indo-Pakistani crises were the 1999 Kargil crisis and the respective crises resulting from the 2001 Indian Parliament attack and the 2008 Mumbai attacks. For an analysis of the potential for escalation and the implications for crisis stability in the first two cases, see Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century*, Santa Monica, Calif.: RAND Corporation, MG-614-AF, 2008, pp. 99–106. For more on the embassy evacuations, see Steve Coll, “The Stand-Off: How Jihadi Groups Helped Provoke the Twenty-First Century’s First Nuclear Crisis,” *The New Yorker*, Vol. 81, No. 46, February 13, 2006, p. 126. For an engaging debate on whether nuclear proliferation in South Asia has ultimately enhanced or detracted from regional stability, see Sumit Ganguly and S. Paul Kapur, *India, Pakistan, and the Bomb: Debating Nuclear Stability in South Asia*, New York: Columbia University Press, 2010.

<sup>6</sup> More detailed accounts of these two cases are provided in Appendix A.

analysts and scholars to explore approaches to managing such confrontations in the future.<sup>7</sup>

The second case, however, is equally interesting. It represents a major crisis that occurred in the pre-nuclear industrial age and illustrates the complex dynamics that can emerge when multiple states with varying levels of power and complex alliances confront one another with conventional forces. Whereas the Cuban missile crisis was managed effectively, the July crisis was not, resulting in world war. While every crisis is idiosyncratic in certain respects, these two cases are archetypal in that, taken together, they capture the major dynamics of crises over the last century and much of what we should expect to see in the coming decades.

### **The Cuban Missile Crisis**

The Cuban missile crisis is an instructive example of effective crisis management. In this case, the leaders of two nuclear-armed superpowers found themselves in a confrontation that could have led to a catastrophic war that neither of them wanted. Each had important interests at stake—not the least of which was personal and national reputation—that neither could afford to completely abandon. Each side attempted to apply coercive pressure on the other, yet both sides were careful to modulate their threats and restrain their forces to avoid pushing the crisis over the brink of war. The leaders of both sides took deliberate steps to slow down the action and back away from the brink at various points in the confrontation, and each leader understood that he would ultimately have to give some amount of ground to his opponent to defuse the crisis.

It began on October 15, 1962, when an analysis of U-2 reconnaissance photographs revealed that, contrary to Moscow's previous assurances, the Soviet Union was building medium- and intermediate-range ballistic missile bases in Cuba.<sup>8</sup> In the days that followed, U.S.

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<sup>7</sup> Graham Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed., New York: Longman, 1999, pp. 1–2.

<sup>8</sup> The President's Foreign Intelligence Advisory Board, "Chronology of Specific Events Relating to the Military Buildup in Cuba," undated, declassified and released August 23, 2002.

leaders confronted their Soviet counterparts privately and publically. The United States imposed a naval blockade on Cuba (which U.S. leaders called a “quarantine” to avoid the appearance of committing an act of war) and applied pressure by increasing the frequency of low-level reconnaissance flights over the island. President John F. Kennedy and Premier Nikita Khrushchev engaged in a tense game of brinkmanship, each warning the other that his actions might lead to nuclear war. The situation almost did on October 27, when a U-2 reconnaissance aircraft was shot down over Cuba and when another, flying a routine air-sampling mission over the Bering Strait, strayed into Soviet airspace. In the end, however, Washington and Moscow negotiated a compromise in which the Soviets would remove the missiles from Cuba in return for a U.S. commitment not to invade the island nation and a secret promise to remove U.S. Jupiter missiles from Turkey.

While this case is informative, and much has been made of it in previous crisis management studies, there are reasons to suspect that it fails to capture all the dynamics of crisis stability and management that could inform preparations for future confrontations. For instance, this case was highly bipolar in that it involved only two principal opponents, each with a nuclear arsenal capable of inflicting catastrophic damage on the other. Therefore, the focal point around which events inevitably gravitated was mutual fear of nuclear war. Both opponents appreciated the grave consequences that would result from a deterrence failure, so they shared a common interest and objective in avoiding that outcome.

What kinds of dynamics might be seen when these conditions are not present? For instance, what happens when multiple actors, widely disparate in size and military capability, are principal parties to the crisis? What dynamics emerge when deterrence via threats of conventional force are the primary tools at hand, when the actors do not fully appreciate the potential costs of a deterrence failure, and when some of the actors may even see war as a preferable outcome to resolving the crisis? For insights into these questions, we turn to the 1914 July crisis.



## The July Crisis

In this case, a cascading series of events plunged Europe into a world war when, on June 28, 1914, the assassination of Archduke Franz Ferdinand gave Austria-Hungary a pretext for trying to impose suzerainty over its Balkan rival, Serbia. Leaders of all the great powers of Europe understood the dangers of such a move: Russia was Serbia's patron, Germany was Austria-Hungary's ally, France was Russia's ally, and Britain was a Triple Entente partner with France and Russia. All were interested in avoiding a major war. Yet, several were willing—perhaps even eager—to fight a limited war to settle historical grievances or improve their positions in Europe's balance of power.<sup>9</sup>

However, structural conditions in Europe made a limited war very risky. All the potential belligerents shared contiguous borders, except for Britain. All the continental powers had developed rapid mobilization schedules emulating the Prussian “nation-in-arms” system that proved so effective in getting forces to the field quickly in the Franco-Prussian War, and all had military doctrines emphasizing rapid offensive operations. Each believed that being as little as one to three days late in mobilizing and deploying forces to the frontier could mean

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<sup>9</sup> There is a rich body of literature on the causes of World War I. This chapter and Appendix A focus on proximate causes and how structural instabilities undermined efforts to manage the crisis. Factors that set the stage for this instability included Germany's rapid industrialization, which was perceived as a threat to British economic power, an Anglo-German naval arms race, imperial ambitions and insecurities among the great powers, historical grievances and rivalries, and domestic political dynamics in France, Germany, and Austria-Hungary. The era was also marked by sociocultural developments, such as the influence of Social Darwinism on military thinking. For some of the more important works on the causes of World War I not cited elsewhere in this report, see Luigi Albertini, *Origins of the War of 1914*, London: Oxford University Press, 1953; David Fromkin, *Europe's Last Summer: Who Started the Great War in 1914?* New York: Alfred A. Knopf, 2004; Ruth B. Henig, *The Origins of the First World War*, London: Routledge, 2002; Paul Kennedy, *The Rise of the Anglo-German Antagonism, 1860–1914*, London: Allen and Unwin, 1980; A. J. P. Taylor, *The Struggle for Mastery in Europe, 1848–1918*, London: Oxford University Press, 1954; A. J. P. Taylor, *War by Timetable: How the First World War Began*, New York: American Heritage, 1969; Tim Travers, *The Killing Ground: The British Army, The Western Front and The Emergence of Modern Warfare, 1900–1918*, London: Unwin Hyman, 1990; and Samuel R. Williamson, *Austria-Hungary and the Origins of the First World War*, New York: St. Martin's Press, 1991.

defeat.<sup>10</sup> As a result, even though the major powers engaged in diplomatic efforts to avoid a major war, they also began mobilizing their forces as a precaution. The threat of attack that such actions implied to their neighbors resulted in chain reactions of mobilization and forward movement, building inexorable momentum toward war.<sup>11</sup>

These factors, along with the countries' interlocking alliances, meant that the war spread very rapidly once the flames ignited. Russia began mobilizing to protect Serbia. In response, Germany mobilized against Russia, and France mobilized against Germany. German leaders believed they could defeat France quickly and redeploy their forces to meet Russia before that country, with its vast expanses and underdeveloped transportation system, could fully mobilize. But to do so, the German Army would have to violate Belgian neutrality to attack France from its nearly unprotected flank. For London, a principal signatory to the Convention of 1839, which guaranteed Belgium's neutrality in any war between the great powers, this all but guaranteed involvement in a war against Germany.<sup>12</sup>

Thus, efforts to manage the July crisis were so thoroughly undermined by Europe's structural instability that war was not averted. These observations have significant implications for efforts to manage future international crises.

## Crisis Management and Crisis Stability

As these two cases illustrate, the wide range of dynamics that international crises exhibit presents substantial challenges to political and military leaders seeking to preserve stability in the global environment.

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<sup>10</sup> Stephen Van Evera, "The Cult of the Offensive and the First World War," *International Security*, Vol. 9, No. 1, Summer 1984, pp. 72–75.

<sup>11</sup> Michael Howard, *The First World War: A Very Short Introduction*, Oxford, UK: Oxford University Press, 2007, p. 24.

<sup>12</sup> Hew Strachan, *The Outbreak of the First World War*, Oxford, UK: Oxford University Press, 2004, p. 121. Not only was London a principal signatory to the convention, it was also its host. The agreement is often called the First Treaty of London, or simply the Treaty of London.

This section addresses those challenges directly. It begins by explaining the fundamentals of crisis management and stability, and it offers a set of operational principles for managing international crises. In the context of the cases discussed here, such principles are helpful, but their efficacy is limited if the underlying structure of the geopolitical system is unstable. Therefore, the section concludes by examining the concept of structural stability more closely and explaining how it can be strengthened.

### **The Fundamentals of Crisis Management and Crisis Stability**

Crisis management is the process by which policymakers seek to defuse a threat of war with other powerful states without surrendering important national interests. It employs elements of deterrence, coercive diplomacy, assurance, and inducement to persuade other actors that resolving a confrontation peacefully would serve their interests better than resorting to or escalating the use of force.<sup>13</sup> Because the crisis management process involves complex interactions between leaders who are usually distant from one another, perceptions are critical: Each party's capabilities, words, and actions signal intent to other parties, and actions taken purely to safeguard one's interests may be seen as threatening by other actors. Security dilemmas are intensified in international crises. Risks of misperception are high, and miscalculations can be catastrophic.<sup>14</sup>

Because all crises are dynamic, multiplayer interactions, no single actor can impose stability. No crisis can be *controlled* per se, because stability depends as much on the behavior of other actors that also have

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<sup>13</sup> Inducements are an important and often forgotten element of crisis management. However, as Robert Art argues, they should not be offered early in a confrontation because doing so tends to suggest to opponents that one lacks the resolve to carry out coercive threats or the stomach to fight. See Robert J. Art, "Coercive Diplomacy: What Do We Know?" in Robert J. Art and Patrick M. Cronin, eds., *The United States and Coercive Diplomacy*, Washington, D.C.: United States Institute of Peace Press, 2003, pp. 397–399. For the seminal work on inducements as a form of influence, see David A. Baldwin, "The Power of Positive Sanctions," *World Politics*, Vol. 24, No. 1, October 1971.

<sup>14</sup> For an examination of the many reasons for misperception during international crises, see Lebow, 1984a, pp. 101–228.

interests to protect. Crisis stability exists when, despite the conflict of interests at hand, no party believes that starting a war would work to its advantage, at least for the time being. As a result, when states genuinely hope to avoid war, such as in the Cuban missile crisis (in which a breakdown could have resulted in nuclear devastation), stability depends on each side feeling secure in the “assurance against being caught by surprise, the safety in waiting, the absence of a premium on jumping the gun.”<sup>15</sup> Each must be confident that it has either adequate defenses to defeat an opponent’s attack or enough survivable counter-strike capabilities to deter it. However, if one or more states are willing to risk limited war to advance their interests at another party’s expense, as was the case with Austria-Hungary and Germany in the July crisis, then crisis stability continues only as long as the would-be aggressors doubt that their attacks would yield sufficient benefit to justify the risks involved. Once again, stability depends on all parties continuing in the belief that initiating conflict would not work to their advantage.<sup>16</sup>

Crisis instability emerges when any opponent begins to feel an urgency to attack. Several perceptions can generate this mental state. It can arise if one or more of the parties begin to sense that the crisis is getting out of control—that is, that deterrence is failing or some other aspect of crisis management is breaking down—and war is becoming inevitable. The pressure is intensified if any of those actors believes there is a premium on striking first, either for damage limitation or to avoid serious disadvantage on the battlefield.<sup>17</sup> Although all parties to a crisis may want to avoid war, when war seems to be inescapable, some might conclude that striking first is preferable to absorbing a crippling first strike. Then, starting a war begins to appear the lesser of inevitable

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<sup>15</sup> Schelling, 1966, p. 235. See also Albert Wohlstetter, “The Delicate Balance of Terror,” *Foreign Affairs*, Vol. 37, No. 2, January 1959.

<sup>16</sup> I would like to thank RAND colleague Karl Mueller for his insights on the difference between definitions of crisis stability developed during the Cold War, when confrontations between nuclear superpowers were the dominant concern, and the more nuanced definition needed to understand crisis stability in potential future confrontations with risk-acceptant regional nuclear powers and powerful conventionally armed states.

<sup>17</sup> Alexander L. George, “Crisis Management: The Interaction of Political and Military Considerations,” *Survival*, Vol. 26, No. 5, 1984, p. 230.

evils. But even if neither of the foregoing conditions is met, if any party to a crisis does harbor aggressive ambitions and sees a clear opportunity to act, the desire to exploit that opportunity before it passes can generate its own pressure to attack, thereby undermining crisis stability.<sup>18</sup> German leaders experienced this kind of urgency in early July 1914, and they imposed it on Austria-Hungary when they urged Austrian leaders to defeat Serbia quickly before another power could intervene.<sup>19</sup> As that episode also illustrates, crisis stability is more difficult to maintain when multiple belligerents, widely disparate in their levels of power and satisfaction with the status quo, are in engaged in the confrontation.<sup>20</sup>

It is important to point out that a crisis can become unstable regardless of which party first begins to feel the pressure to attack, or even whether any of the parties' fears are truly justified. When the leaders of any state sense that stability is breaking down and begin to suspect that war cannot be avoided, they are apt to conclude that they have no alternative but to begin or accelerate their military preparations. Those preparations are likely to suggest aggressive intent to other actors that observe them, prompting them to accelerate their

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<sup>18</sup> Windows of opportunity and vulnerability have long been held to be prominent causes of war. For what is probably the most carefully articulated presentation of this argument, see Van Evera, 1999. For counterarguments, see Richard Ned Lebow, "Windows of Opportunity: Do States Jump Through Them?" *International Security*, Vol. 9, No. 1, Summer 1984b, and Dan Reiter, "Exploding the Power Keg Myth: Preemptive Wars Almost Never Happen," *International Security*, Vol. 20, No. 2, Fall 1995.

<sup>19</sup> As Germany's development of its Blitzkrieg doctrine in the interwar years testifies, the availability of a seemingly dominant strategy—or, in this case, operational doctrine—in the hands of an aggressive leader can also be destabilizing. For more on the effects of strategy and doctrine on conventional deterrence and crisis stability, see John J. Mearsheimer, *Conventional Deterrence*, Ithaca, N.Y.: Cornell University Press, 1983, and Christopher P. Twomey, *The Military Lens: Doctrinal Difference and Deterrence Failure in Sino-American Relations*, Ithaca, N.Y.: Cornell University Press, 2010.

<sup>20</sup> Robert Powell illuminated the dynamics generated in such distributions of power and dissatisfaction with game-theoretic modeling. See Robert Powell, "Stability and the Distribution of Power," *World Politics*, Vol. 48, No. 2, January 1996. For discussions on the dynamics that can emerge in asymmetric confrontations involving nuclear weapons, see Paul K. Huth, "The Extended Deterrent Value of Nuclear Weapons," *Journal of Conflict Resolution*, Vol. 34, No. 2, June 1990.

own preparations as well. Such observations and fears can fuel action-reaction cycles that culminate in preemption or near-simultaneous attack. As the July crisis illustrates, stability is particularly vulnerable if any of the opponents believes it is susceptible to surprise attack, that the time for critical decisionmaking is diminishing, or that allowing the enemy to attack first might put it at a war-losing disadvantage.<sup>21</sup>

Yet, some or even all of these beliefs might be unjustified. In 1914, none of the belligerents was caught by surprise; each detected and monitored the other parties' mobilization and military deployments.<sup>22</sup> Although events accelerated over the course of the crisis, all parties had days to make most of the important decisions. Finally, and most critically, although all the continental powers believed in the primacy of the offensive and, therefore, feared that not attacking first might fatally undermine their security, they were wrong. Technical developments, such as the machine gun, heavy artillery, and barbed wire, had made the open battlefield a lethal environment, shifting tactical advantages to defensive operations.<sup>23</sup> Had political and military leaders understood that in 1914, the catastrophe might have been averted. As this case so dramatically illustrates, crisis stability depends more on decisionmakers' beliefs, perceptions, and expectations than on any objective reality.<sup>24</sup>

It should be noted that confrontations between mature nuclear powers are inherently more stable than those in which one or more of the belligerents have only conventional forces or emergent nuclear

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<sup>21</sup> George, 1984, pp. 229–230; Schelling, 1966, pp. 221–234.

<sup>22</sup> Van Evera, 1984, pp. 75–78.

<sup>23</sup> Interestingly, this was largely true during the Franco-Prussian War as well. Prussian Chief of the General Staff Helmuth von Moltke recognized the lethality of defensive fires that repeating rifles and breach-loading artillery could generate. Therefore, the doctrines he developed emphasized combining the operational offensive (using rapid maneuver to besiege cities and fortresses and envelop enemy forces) with the *tactical defensive* (relying on defensive fires to mow down enemy troops as they tried to break out of the encirclements). Later doctrines that emphasized the primacy of the offensive were based on poorly taken lessons of the Franco-Prussian War.

<sup>24</sup> For the seminal work in this area, see Robert Jervis, "Deterrence and Perception," *International Security*, Vol. 7, No. 3, Winter 1982–1983.

capabilities.<sup>25</sup> The shared risks of catastrophic destruction in confrontations between established nuclear states tend to make all sides exceptionally cautious. In fact, game theorist Robert Powell has demonstrated that, in ideal conditions, bipolar nuclear confrontations can remain stable even if both belligerents believe one side has a notable first-strike advantage.<sup>26</sup>

Given these considerations, one might wonder why U.S. leaders should be concerned about crisis stability in the emerging strategic environment. U.S. forces can easily defeat states that have only conventional weapons, and nuclear-armed regional powers should be cautious if they find themselves confronted by a nuclear superpower. Yet, maintaining crisis stability could be more challenging in the future than it ever was before. The problem lies at the nexus of the conventional and nuclear domains: the proliferation of nuclear weapons, the difficulty of deterring adversaries from conventional aggression, and the unpredictable behaviors that emergent nuclear powers could exhibit in the belief that their newly gained capabilities allow them to change the regional status quo (then panicking when they find themselves unexpectedly confronted by more powerful opponents). In fact, there is a risk of confrontation, instability, and rapid escalation even between long-

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<sup>25</sup> Earlier RAND work defined a mature nuclear power as a state that has met the following conditions:

When it possesses a survivable second-strike capability, supported by reliable surveillance and warning systems and a sophisticated command-and-control system with safeguards comparable to the permissive-action links employed by the United States and Russia; its custodial forces attain a high state of professionalism, having been thoroughly trained according to a nuclear doctrine emphasizing surety and national authority over weapon control and release; when military and civilian leaders are sufficiently educated and experienced in nuclear diplomacy to understand not only the coercive potential of nuclear weapons, but also the limitations of their utility and the grave responsibilities that come with possessing them. (Morgan et al., 2008, p. 88)

<sup>26</sup> The four conditions that Powell lists are as follows: (1) there can be no risk of accidental nuclear attack; (2) whenever a state has the option of attacking, it also has the option of submitting to its adversary; (3) no state will attack unless it believes that the probability of war is greater than 50 percent; and (4) the first three conditions are fully and correctly known to both sides. Robert J. Powell, "Crisis Stability in the Nuclear Age," *American Political Science Review*, Vol. 83, No. 1, March 1989.

established nuclear states when dramatic asymmetries of power exist at the conventional level.<sup>27</sup>

All of this creates a serious dilemma for political and military leaders. On the one hand, the pursuit of one's security during a crisis can send signals of aggressive intent and frighten other actors, increasing the risk that stability will collapse. On the other hand, failure to hedge against the possibility that crisis stability might collapse could leave a state vulnerable in the event of war. In fact, failing to take adequate military precautions during a crisis might even encourage an opponent to try to change the status quo if it perceives a window of opportunity to accomplish its aggressive objectives.<sup>28</sup> Complicating matters is the fact that the dynamics of crisis stability are not mere musings in an abstract world; in an actual confrontation, there are very real interests at stake for which each party is competing in a contest of coercive diplomacy. Abandoning one's interests might avert the crisis at hand, but that solution would likely be unacceptable for the United States. Rather, U.S. leaders will want to orchestrate all available instruments of power and engage in coercive bargaining in an effort to obtain U.S. objectives while maintaining crisis stability.<sup>29</sup> That will require a care-

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<sup>27</sup> For a frank examination of the instabilities and severe escalation risks that could emerge in a confrontation between the United States and Russia, see Forrest E. Morgan, "Dancing with the Bear: Managing Escalation in a Conflict with Russia," *Proliferation Papers*, No. 40, Paris: French Institute of International Relations, Winter 2012.

<sup>28</sup> Van Evera, 1999, pp. 73–105. Also see Stephen Van Evera, "Offense, Defense, and the Causes of War," *International Security*, Vol. 22, No. 4, Spring 1998, pp. 9–10, 30, 41–43.

<sup>29</sup> Thomas Schelling introduced the concept of coercive bargaining in strategy, communication, and limited war in 1960, and he applied the concept more directly to crisis management in 1966. Since that time, a substantial body of literature has emerged, much of it employing formal game theory, exploring the dynamics of various coercive bargaining constructs. For the seminal work in this field, see Thomas C. Schelling, *The Strategy of Conflict*, Cambridge, Mass.: Harvard University Press, 1960, and Schelling, 1966, especially pp. 131–141. For more recent game theoretic examinations of coercive bargaining, see James D. Fearon, "Signaling Versus the Balance of Power and Interests: An Empirical Test of a Crisis Bargaining Model," *Journal of Conflict Resolution*, Vol. 38, No. 2, June 1994; James D. Fearon, "Signaling Foreign Policy Interests: Tying Hands Versus Sinking Costs," *Journal of Conflict Resolution*, Vol. 41, No. 1, February 1997; Robert Powell, "Bargaining Theory and International Conflict," *Annual Review of Political Science*, No. 5, 2002; and Powell, 1996.



fully crafted politico-military strategy employing a unique set of operational principles.

### **The Operational Principles of Crisis Management**

In a landmark study on crisis management conducted at the end of the Cold War, Alexander George observed that the need to deal with the tensions that exist between the “diplomatic logic” of negotiation and compromise and the “military logic” of defense and the forceful pursuit of national interest generates a particular set of operational requirements. He identified these requirements and called them the seven operational principles of crisis management. They are as follows:

1. Each side’s political authorities must maintain informed control of some kind over military options—alerts, deployments, and low-level actions, as well as the selection and timing of military movements.
2. The tempo and momentum of military movements may have to be deliberately slowed down and pauses created to provide enough time for the two sides to exchange diplomatic signals and communications and to give each side adequate time to assess the situation, make decisions, and respond to proposals.
3. Movements of military forces must be carefully coordinated with diplomatic actions as part of an integrated strategy for terminating the crisis acceptably without war or escalation to higher levels of violence.
4. Movements of military forces and threats of force intended to signal resolve must be consistent with limited diplomatic objectives—that is, “noise” must be avoided or minimized.
5. Military moves and threats should be avoided that give the opponent the impression that one is about to resort to large-scale warfare, thereby forcing him to consider preemption.
6. Diplomatic-military options should be carefully chosen that signal, or are consistent with, a desire to negotiate a way out of the crisis rather than to seek a military solution.

7. Diplomatic proposals and military moves should be selected that leave the opponent a way out of the crisis that is compatible with his fundamental interests.<sup>30</sup>

These principles capture the essence of the delicate politico-military strategy that national leaders need to effectively manage a confrontation between powerful states. Employing such guidelines for strategy development would help ensure that military moves are kept under close political control, carefully orchestrated in coordination with diplomatic actions, and moderated to avoid prompting the opponent to escalate out of fear. The principles highlight the need for clear signaling and leaving opponents a way out of the crisis that does not compromise their fundamental interests. The basic approach is sound.

Yet, certain aspects of George's principles are suggestive of the narrow Cold War experience that inspired them. References to "the two sides" in principle 2 and "the opponent" in principles 5 and 7 reveal that he had a bipolar confrontation in mind when he developed these precepts. Moreover, the general tone they project, with an emphasis on slowing down the action, moderating threats, and allowing the opponent an acceptable way out of the crisis, seems to assume that the opponent is indeed seeking a way out of the crisis that would safeguard its fundamental national interests without substantially improving its standing at U.S. expense. That is, George's principles seem to assume that the opponent values compromise over war. Such assumptions were reasonable at the height of the Cold War, when any conflict between the superpowers could have escalated in a way that threatened the national survival of both belligerents, but it is not clear that they hold true in the complex geopolitical environment of the 21st century.

The United States now exists in a world that is increasingly multipolar and heterogeneous.<sup>31</sup> Instead of a global strategic landscape

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<sup>30</sup> George, 1991b, p. 25. George also published these principles as "operational requirements" in a brief article on crisis management a few years earlier. See George, 1984, p. 226.

<sup>31</sup> Numerous studies have been conducted on the nature of the emerging 21st-century threat environment. For just a few examples, see Andrew R. Hoehn, Adam Grissom, David Ochmanek, David A. Shlapak, and Alan J. Vick, *A New Division of Labor: Meeting America's Security Challenges Beyond Iraq*, Santa Monica, Calif.: RAND Corporation, MG-499-AF,

dominated by two superpower opponents sufficiently risk-averse that they share a common interest in avoiding war, nuclear proliferation and asymmetric threats have created several regional domains, each with multiple actors that are widely disparate in power. These actors also have varying levels of dissatisfaction with the status quo and therefore exhibit varying levels of risk tolerance. The United States has complex security commitments in these regions, which could pull it into local conflicts. All considered, these factors suggest that future confrontations with nuclear states might, in some respects, have more in common with the July crisis than the Cuban missile crisis. As a result, we should not take for granted the underlying determinants of structural stability that made the Cuban missile crisis manageable. Rather, we should examine those elements explicitly.

### The Concept of Structural Stability

The term *structural stability* refers to the degree to which preexisting conditions in the geostrategic environment are conducive to crisis stability when a confrontation occurs between states.<sup>32</sup> Recalling that a crisis remains stable so long as none of the parties to it believes that initiating conflict would work to its advantage, the underlying conditions of structural stability include elements of geography, political relationships, and force structure (e.g., size, composition, disposition, technology, doctrine).<sup>33</sup> In brief, conditions that deter attack or cause

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2007; David Ochmanek and Lowell H. Schwartz, *The Challenge of Nuclear-Armed Regional Adversaries*, Santa Monica, Calif.: RAND Corporation, MG-671-AF, 2008; Paul K. Davis and Peter A. Wilson, *Looming Discontinuities in U.S. Military Strategy and Defense Planning: Colliding RMAs Necessitate a New Strategy*, Santa Monica, Calif.: RAND Corporation, OP-326-OSD, 2011; and Christopher P. Twomey, "Asia's Complex Strategic Environment: Nuclear Multipolarity and Other Dangers," *Asia Policy*, No. 11, January 2011.

<sup>32</sup> For detailed discussion of what constitutes "stability," in terms of both definitions and nuclear and conventional structural elements, see Robert Axelrod, "The Concept of Stability in the Context of Conventional War in Europe," *Journal of Peace Research*, Vol. 27, No. 3, August 1990.

<sup>33</sup> Powell, 1989; Schelling, 1966, pp. 244–245; Laurence S. Seidman, "Crisis Stability," *Journal of Conflict Resolution*, Vol. 34, No. 1, March 1990. This concept closely parallels what Van Evera identifies as the dynamics of offense and defense dominance. See Van Evera, 1998, p. 6.

national leaders to believe that successful attack would be more difficult than successful defense contribute to structural stability, and conditions that invite attack or cause national leaders to believe that successful defense would be more difficult than successful attack erode structural stability.<sup>34</sup>

The contrasting dynamics in the Cuban missile crisis and the July crisis exemplify these principles. In the former, the looming threat of nuclear devastation deterred both parties from rash behavior. Although neither the United States nor the Soviet Union had, by 1962, explicitly recognized a condition of mutual assured destruction (MAD), the nuclear arsenals of both parties were sufficiently robust and dispersed that neither had confidence that it could strike the other without receiving a devastating strike in return. This sobering realization imposed a stabilizing damper on the crisis. Meanwhile, the principal opponents' geographical separation allowed time for measured actions with conventional forces, and although their close proximity in Berlin, Cuba, and the Bering Strait offered flashpoints where destabilizing clashes could have occurred, the mutual fear of escalation (along with a good measure of luck) helped them avoid catastrophes there and dampened the effects of the mishaps that did occur. But no such dampening function existed in Europe in 1914. There, the geopolitical configuration of the continent, with powers sharing contiguous borders, made all those states feel vulnerable to surprise attack. Rapid mobilization schedules and military doctrines emphasizing the primacy of the offensive heightened those fears, convincing national leaders that, should war appear likely, they would have to mobilize quickly and strike first to avoid rapid defeat. The interlocking alliances—which some national leaders believed would preserve stability through a balance of power and others hoped would allow them to dominate that balance—only ensured that war would be widespread once the flames ignited.<sup>35</sup>

It is important to note that Britain enjoyed a measure of structural stability separate from that of the continental powers. Protected by a

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<sup>34</sup> See Van Evera, 1999, pp. 35–38.

<sup>35</sup> John Keegan, *The First World War*, New York: Vintage Books, 2000, p. 52; Strachan, 2004, pp. 124–125.

buffer of sea dominated by the Royal Navy and lacking continental forces vulnerable to attack by its potential adversaries, London was free to enter a continental war on its own terms or remain neutral, whichever British leaders determined would best serve the national interest.<sup>36</sup> Yet, even Britain was not completely immune to the structural instability that infected the continent. The German Navy's rapid growth in the decades prior to the war triggered fears that the Royal Navy was growing vulnerable to a surprise attack. And, ultimately, London's policy of maintaining a favorable balance of power in Europe, and the diplomatic commitments to Belgium, France, and Russia that such a policy required, pulled the island nation into the conflict.

Interestingly, some analysts have argued that if the British government had clearly stated earlier in July that the country would, if necessary, go to war to defend its Triple Entente partners, or that any violation of Belgian neutrality would demand a British intervention, it might have succeeded in stabilizing the crisis. Berlin would have stopped encouraging Vienna's aggression against Belgrade and might have, instead, compelled Austria-Hungary to accept Serbia's conciliatory response to the ultimatum.<sup>37</sup> Had events unfolded that way, one could only guess how long the peace would have held, given the degree of structural instability then prevalent on the continent. However, the important consideration for this study is that London had a degree of freedom that the other powers did not. Britain's ability to stand off the continent, free from the threat of surprise attack, and project force from afar offered it an advantage in structural stability. *Britain, in essence, enjoyed one of the benefits of long-range strike.*

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<sup>36</sup> Keegan, 2000, p. 45.

<sup>37</sup> Jack S. Levy, "The Role of Crisis Management in the Outbreak of World War I," in Alexander L. George, ed., *Avoiding War: Problems of Crisis Management*, Boulder, Colo.: Westview Press, 1991, pp. 72–75, 80–82; Strachan, 2004, p. 124; and Van Evera, 1984, pp. 100–101.

## The Importance of Force Structure

Crisis management is largely about strategy, but as the discussion of structural stability made clear, effectively managing a crisis can be perilously difficult if the underlying structure of the geopolitical environment is unstable. Military forces are an important element of that structure, either contributing to stability or undermining it. In today's world, strike aircraft and missiles have greater bearing on crisis stability than other military force elements because they can be deployed quickly and attack from afar. This section identifies the attributes that strike assets need to contribute to structural stability and explains which additional attributes are desirable to provide decisionmakers with effective tools for crisis management.<sup>38</sup>

### Attributes Conducive to Structural Stability

In the event that the United States finds itself in a confrontation with one or more dangerous states, U.S. leaders will need forces that they can quickly posture in a way that deters attack without prompting opponents to preempt. All U.S. military forces contribute to deterrence in some respect. Indeed, any adversary contemplating a war with the United States would have to weigh its prospects of military success against the most powerful state on Earth. But certain U.S. force elements would play a more direct and immediate role in stabilizing a crisis than others. Should a risk-averse opponent find itself in a confrontation with the United States, it might look ahead and doubt whether it could win a war against the robust air, land, and sea components of a fully mobilized U.S. military combatant command and, consequently, be deterred from attacking. Unfortunately, U.S. leaders cannot count on future adversaries always exercising such foresight or prudence. Instead, an ambitious, risk-tolerant adversary—one seriously seeking

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<sup>38</sup> Note that for the purposes of this analysis, the relevant attributes of strike assets are divided into six discrete categories, allowing them to be evaluated and compared systematically. The three that are most relevant to structural stability are labeled as such, as are the three that are most relevant to crisis management. This does not suggest that these attributes operate independently in the real world or that the structural stability attributes are not important factors in crisis management.

to change the status quo—might consider how long it would take the United States to bring its forces to bear and conclude that it could achieve a *fait accompli*, either by attacking before those forces are mobilized or by letting them deploy to the region and then striking them preemptively. Surface forces are potent military instruments, but they take time to deploy and must be put into battle formation relatively close to the opponent before they can be employed.

Air and missile strike assets offer the greatest ability to respond to international crises quickly. Yet, those systems are not equal in terms of the qualities they contribute to structural stability. Some bring greater strengths to the table than others, and some exhibit characteristics that could detract from stability in a crisis. To compare how alternative strike assets might affect the dynamics of an international crisis, one must first identify which attributes of structural stability one would like these assets to offer. To contribute to structural stability, strike assets should have the following characteristics.

***Strike Assets Should Be Sufficiently Potent to Deter a Conventional Attack***

Deterrence is the foundation of structural stability. During the Cuban missile crisis, the mutual deterrence imposed by the risk of nuclear war made both sides sufficiently cautious to keep the confrontation stable long enough to negotiate a resolution. As previously mentioned, given that the United States possesses one of the world's most powerful nuclear forces, one might wonder why U.S. leaders should be concerned about crisis stability in future confrontations. The answer, if not immediately apparent, is nonetheless straightforward. While the contributions that nuclear deterrence can make to structural stability are important, they are limited. There are two reasons for this.

First, while threats of nuclear retribution are very effective in deterring nuclear attacks and serious conventional threats against the homeland, they have proven less effective in deterring conventional attacks abroad. U.S. nuclear superiority did not deter China from intervening in the Korean War or North Vietnam from attacking South Vietnam, and it has been almost irrelevant in all the conflicts in which the United States has been involved since the end of the Cold War.

This is because it is very difficult to make threats of nuclear reprisal credible in response to conventional aggression. U.S. leaders would not likely authorize the use of such disproportionate force, and potential adversaries know it. Therefore, any threat to do so, whether explicit or implied, would likely have little deterrent effect.

The second reason that the role of nuclear deterrence will probably be limited in future international crises is that U.S. leaders would prefer to keep it that way. Current U.S. policy seeks to reduce the salience of nuclear weapons in international relations.<sup>39</sup> Not only is that goal politically desirable, it is strategically sound. Confrontations between dangerous states, even nuclear-armed regional adversaries, are likely to begin at the conventional level. The existence of nuclear weapons will always cast an ominous shadow on such crises, and should tensions escalate to the point that opponents brandish them, then nuclear deterrence will become a central concern. There is a substantial risk, however, that regional powers that have only recently acquired nuclear weapons might be dangerously unpredictable in confrontations at that level. Lacking experience in nuclear gamesmanship, and with potentially fragile command-and-control systems and questionable second-strike force survivability, leaders of these states might panic or otherwise miscalculate if a crisis approaches the nuclear threshold.<sup>40</sup>

Consequently, U.S. leaders will want to use conventional forces to stabilize future crises to the greatest extent possible. That presents an interesting challenge. While nuclear deterrence relies on the threat of punishing an attacker with sudden catastrophic costs, conventional weapons lack the ability to quickly impose costs of comparable magnitude. As a result, previous efforts to deter even weak, risk-tolerant

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<sup>39</sup> See Executive Office of the President, *National Security Strategy*, Washington, D.C.: White House, May 2010, pp. 23–24; U.S. Department of Defense, *Nuclear Posture Review*, Washington, D.C., April 2010, pp. 15–17; U.S. Joint Chiefs of Staff, *The National Military Strategy of the United States of America: Redefining America's Military Leadership*, Washington, D.C., February 2011a, p. 7; and William J. Perry and James R. Schlesinger, *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States*, Washington, D.C.: United States Institute of Peace Press, 2009.

<sup>40</sup> For a discussion of the dangerous escalation dynamics that might emerge in such crises and how to manage them, see Morgan et al., 2008, pp. 83–115.



adversaries, such as Slobodan Milosevic and Saddam Hussein, have sometimes failed, in part because those individuals believed that they could tolerate the costs of conventional air and missile attacks long enough to fracture the coalitions against them or rally other actors in the international community to intervene politically on their behalf.<sup>41</sup> Yet, conventional deterrence can be strengthened if the force is structured and postured appropriately. Analyses of historical cases have indicated that for conventional deterrence to be effective, it must be sufficiently potent and flexible to allow it to be postured in a way that persuades the adversary that an attack would entail an unacceptably high risk of defeat or, at least, a high risk of being bogged down in a costly war of attrition.<sup>42</sup> In other words, whereas nuclear deterrence relies almost exclusively on threats of punishment, conventional deterrence depends heavily on persuading the opponent that one can deny it the benefits of aggression in addition to imposing punitive costs.<sup>43</sup> In sum, to contribute to structural stability, strike assets must be sufficiently potent to deter a conventional attack by persuading the opponent that they could contribute substantially to its defeat.

### ***Strike Assets Should Be Able to Minimize U.S. Vulnerability to Surprise Attack***

Properly structured and postured strike forces are very intimidating. Indeed, the very point of their use in a crisis would be to impose a powerful deterrent threat. But if posturing forces for that objective requires

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<sup>41</sup> See Art, 2003, pp. 364, 369–370; Jon B. Alterman, “Coercive Diplomacy Against Iraq, 1990–98,” in Art and Cronin, 2003, pp. 283; Steven L. Burg, “Bosnia and Kosovo” in Robert J. Art and Patrick M. Cronin, eds., *The United States and Coercive Diplomacy*, Washington, D.C.: United States Institute of Peace Press, 2003, pp. 90–96; Stephen T. Hosmer, *The Conflict Over Kosovo: Why Milosevic Decided to Settle When He Did*, Santa Monica, Calif.: RAND Corporation, MR-1351-AF, 2001, pp. 19–34; and Janice Gross Stein, “Deterrence and Compellence in the Gulf, 1990–91: A Failed or Impossible Task?” *International Security*, Vol. 17, No. 2, Fall 1992.

<sup>42</sup> Mearsheimer, 1983, pp. 23–24, 28–30. See also Karen Ruth Adams, “Attack and Conquer? International Anarchy and the Offense-Defense-Deterrence Balance,” *International Security*, Vol. 28, No. 3, Winter 2003–2004.

<sup>43</sup> For the seminal work on conventional deterrence via denial, see Glenn H. Snyder, “Deterrence and Power,” *Journal of Conflict Resolution*, Vol. 4, No. 2, June 1960.

exposing them to the risk of a surprise attack, then a risk-tolerant opponent might be tempted to preempt. Structural stability requires forces that are powerful enough to deter a potential enemy but employable in ways that minimize their exposure to preemption.<sup>44</sup> There are several possible approaches to structuring such forces. They can be made flexible and responsive enough to be quickly dispersed. Their exact locations can be concealed during basing or employment. They can be provided with active and passive defenses at bases and on patrol. And they can be designed with sufficient range to allow them to impose a threat from afar. A strike force designed to maximize structural stability would likely incorporate several of these approaches.

***Strike Assets Should Be Able to Mitigate the Threat of U.S. Surprise Attack***

This attribute is counterintuitive. Surprise has always been a highly valued means of achieving tactical objectives in war—so much so that it is enshrined as one of the nine “principles of war” codified as the “bedrock” of U.S. military doctrine.<sup>45</sup> Indeed, striking at a time, in a place, or in a manner for which an enemy is unprepared can disorient and unhinge its defenses, generating success greatly out of proportion with the effort expended. That is an important goal once war has begun, but during an international crisis, posturing powerful forces in a way that suggests that a surprise attack is imminent can lead an opponent to conclude that it has no alternative but to launch a preemptive strike of its own. Therefore, structural stability requires forces that can be postured to impose a potent deterrent threat while mitigating the immediate peril of U.S. surprise attack.<sup>46</sup>

It is important to emphasize that strike forces should *mitigate* the threat of surprise attack, not *minimize* it. No state confronting the United States with military force should ever feel completely safe from

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<sup>44</sup> Axelrod, 1990; Schelling, 1966, pp. 224–230.

<sup>45</sup> U.S. Joint Chiefs of Staff, *Joint Operations*, Joint Publication 3-0, Washington, D.C., August 11, 2011b, pp. I-1–I-2.

<sup>46</sup> Axelrod, 1990; George, 1991b, p. 25; Schelling, 1966, pp. 224–230; Van Evera, 1984, pp. 105–107.

rapid destruction. Securing U.S. interests in a crisis requires coercive diplomacy, and the ability to manipulate an opponent's fear of surprise attack is an important lever of coercion that U.S. leaders will want to have available. But strike forces need the ability to impose such threats in ways that do not persuade opponents that their destruction is imminent. They should be allowed to believe that they still have time to weigh their alternatives and negotiate, but they must also be allowed to worry that time could run out and catastrophe is looming.<sup>47</sup>

### **Attributes That Provide Tools for Crisis Management**

Structural stability is only a prerequisite for effective crisis management. If crisis management only required deterring an opponent's attack, it might be accomplished by deploying powerful defenses wherever confrontations are likely to occur. But any strategy relying on static defenses suffers from the inability to predict where the next crisis will erupt. Moreover, once in a confrontation, U.S. leaders will want to do more than simply deter the aggressive ambitions of other states. They will want to defuse the crisis on terms favorable to U.S. interests. That will require strategies for applying coercive pressure to compel opponents to accept a settlement favorable to the United States. Strike assets

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<sup>47</sup> For more on the dynamics and necessary conditions of successful coercive diplomacy, see Art, 2003, pp. 359–410; Alexander L. George, *Forceful Persuasion: Coercive Diplomacy as an Alternative to War*, Washington, D.C.: United States Institute of Peace Press, 1991a; and Alexander L. George and William E. Simons, *The Limits of Coercive Diplomacy*, 2nd ed., Boulder, Colo.: Westview Press, 1994. Other important works on coercive diplomacy include Lawrence Freedman, ed., *Strategic Coercion: Concepts and Cases*, Oxford, UK: Oxford University Press, 1998; Peter Jakobsen, *Western Uses of Coercive Diplomacy After the Cold War: A Challenge for Theory and Practice*, New York: St. Martin's Press, 1998; and Daniel L. Byman and Matthew C. Waxman, *The Dynamics of Coercion: American Foreign Policy and the Limits of Military Might*, Cambridge, UK: Cambridge University Press, 2002. For analyses of the efficacy of airpower and other forms of military force in coercion, see Daniel L. Byman, Matthew C. Waxman, and Eric Larson, *Air Power as a Coercive Instrument*, Santa Monica, Calif.: RAND Corporation, MR-1061-AF, 1999; David E. Johnson, Karl P. Mueller, and William H. Taft, *Conventional Coercion Across the Spectrum of Operations: The Utility of U.S. Military Forces in the Emerging Security Environment*, Santa Monica, Calif.: RAND Corporation, MR-1494-A, 2002; and Robert A. Pape, *Bombing to Win: Air Power and Coercion in War*, Ithaca, N.Y.: Cornell University Press, 1996.

should have capabilities to support such strategies whenever and wherever they are needed. Therefore, they will need the following attributes.

***Strike Assets Should Be Flexible***

Experience suggests that the timing and locations of future international crises will be difficult to anticipate. Crises tend to erupt suddenly in places distant and geographically different from those of earlier crises. Therefore, for strike assets to be useful as tools for crisis management, they will need to be flexible. They should have utility in a wide variety of scenarios, and they should offer a broad selection of employment profiles within each of those scenarios.

***Strike Assets Should Be Responsive***

Since crises can erupt suddenly in distant places, strike assets must be capable of prompt alert, deployment, and employment. Furthermore, because crisis management is as much a political function as a military one, the military tools employed to support it should have the ability to modulate their operating tempo in coordination with diplomatic actions. They should be able to accelerate their activities in ways that bring more coercive pressure to bear when needed but promptly relieve that pressure if national leaders decide that the risks of going over the brink are too high or that a conciliatory gesture is in order to show good faith or reward an opponent for taking a positive military or political step toward crisis resolution.<sup>48</sup>

***Strike Assets Should Offer Capabilities for Signaling***

In times of international crisis, when security dilemmas are heightened, actions speak louder than words. All assurances of nonaggressive intent will appear suspect if one's defensive military posture cannot be distinguished from preparations for attack. Conversely, coercive threats lack credibility if one's military posture does not clearly communicate both the will and the ability to carry out such attacks. Therefore, to be most effective as tools for crisis management, strike assets need to be employable in ways that visibly communicate one's capability, resolve, and restraint—a determination and ability to prevail should the crisis

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<sup>48</sup> These requirements support George's operational principles 1, 2, and 3.

devolve into war, but a willingness to allow time to seek a negotiated settlement—and in ways that the opponent can clearly understand.<sup>49</sup>

## Conclusion

Because the process of crisis management is largely about strategy, its effective employment is more art than science. Every crisis is distinct, and there are no formulaic solutions. Success in managing future confrontations will depend on the how skillfully U.S. political and military leaders wield the instruments of power at their disposal to defuse those crises on terms favorable to the United States. Yet, even the most skillful leaders will have difficulty resolving an international crisis if the structure of the geopolitical system is unstable or if they lack the necessary tools. Strike assets are a central element of structural stability and provide important tools for crisis management. But some strike assets are more stabilizing and offer more utility than others. Chapter Three evaluates and compares the extent to which alternative strike assets exhibit the three attributes of structural stability and three attributes of crisis management highlighted here.

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<sup>49</sup> These requirements support George's operational principles 4, 5, 6, and 7.

## **Attributes of Alternative Strike Systems**

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Strike systems are an important part of the nation's military power during a crisis. They offer national leaders levers for deterrence and coercive diplomacy not immediately available from other military forces. A properly structured and skillfully postured strike force enhances stability and improves the chances that a crisis can be defused on terms that are favorable to the United States. Yet, some strike systems offer more to structural stability and crisis management than others, and some may have qualities that could destabilize a crisis if postured aggressively in certain scenarios. Policymakers and military leaders need to understand the relative strengths and risks that these systems create to structure and employ military forces most effectively.

Chapter Two identified three attributes that enable strike systems to enhance structural stability and three additional attributes that increase their utility as tools for crisis management. This chapter seeks to determine the degree to which strike fighters, bombers, ballistic missiles, and cruise missiles exhibit these attributes. It first explains the methods used to assess and compare the attributes of alternative strike systems. It then presents the findings of that comparative analysis. Finally, it briefly discusses the implications of those findings.

### **Methods Used in the Analysis of Alternative Strike Systems**

The analysis supporting this section was conducted in three steps. Step 1 consisted of disaggregating each of the six attributes into its

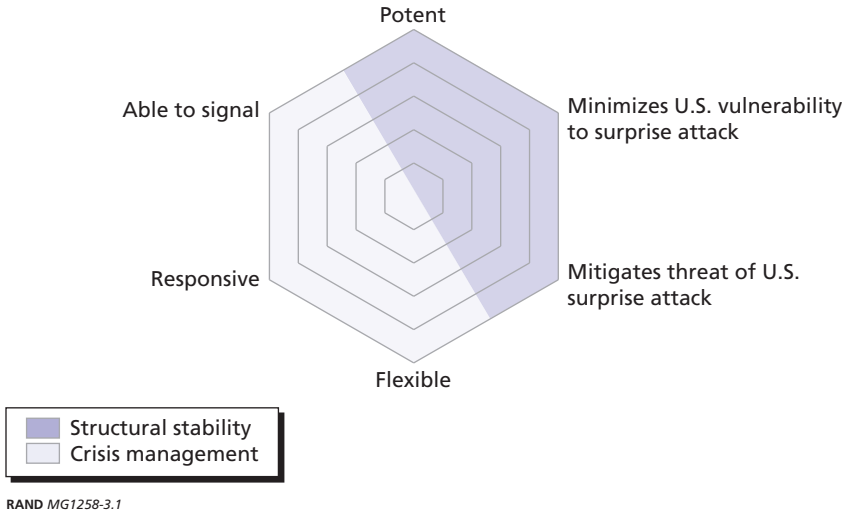
component parts and weighting each part for comparative scoring. The analysis reflects input from subject-matter experts at RAND and on the staff at Headquarters U.S. Air Force in both the identification and the weighting of each attribute's components.

Step 2 involved developing a notional scenario in which the United States confronts a highly capable regional opponent in the 2025–2030 time frame. The U.S. objective in this scenario was to stabilize the crisis short of war without sacrificing important U.S. interests. The opponent was projected to have, among other capabilities, an advanced integrated air defense system (IADS) and a sizable inventory of conventional short-, medium-, and intermediate-range ballistic missiles (SRBMs, MRBMs, and IRBMs), as well as anti-ship ballistic missiles (ASBMs) and anti-ship cruise missiles (ASCMs). All of these missiles were assumed capable of delivering precision-guided munitions (PGMs).

The U.S. force structure used in the scenario was based on projections provided by Air Force planners and future concepts for Air Force and Navy strike systems discussed in open sources. Assumptions about numbers, types, and locations of forces on-station at the beginning of the scenario, as well as those deployed over the course of the crisis, were based on these projections. The numbers and types of ordnance available to the notional war fighters were also based on Air Force and Navy planning projections.

Step 3 entailed working through the scenario and scoring air and missile strike assets in terms of how strongly they exhibited the desired structural stability and crisis management attributes. Scores were assigned on a scale of 0 to 25, with 25 being the best possible.

Finally, after all strike systems were evaluated, the scores were graphed on radar plots for comparison. Figure 3.1 provides an example of these plots. It is a six-dimensional graph marked off in five-point increments from the center out. That is, the inner ring connects the five-point markers on all six dimensions, and the outer ring connects the 25-point markers. Each dimension is labeled according to which structural stability or crisis management attribute it scores, and the tinting illuminates the two categories of attributes.

**Figure 3.1****Example of a Six-Dimensional Radar Plot Used to Display Attribute Scores**

At this point, I must emphasize that the analysis is fundamentally subjective. Although technical data on each strike system were collected and carefully compared, the scores were ultimately based on expert judgment, so no plot should be considered precise.<sup>1</sup> Moreover, point values are not displayed on the rings because the numbers are not important in any absolute sense. What is important are the relative positions of each strike system's scores as compared with the scores of other strike systems.

Appendix B provides a more detailed explanation of the methodology used in this analysis and the individual scores of each attribute's components.

<sup>1</sup> Mindful of this point, the author and the supporting researchers made every effort to be objective and are confident that the plots accurately illustrate the relative strengths and weaknesses of each strike system's attributes.



## Findings from the Analysis of Alternative Strike Systems

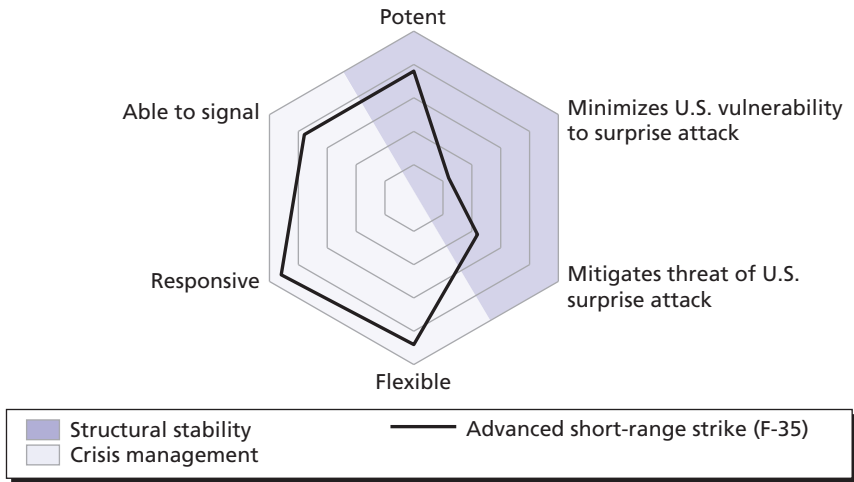
### The Dangers of Close-Based Short-Range Strike

Short-range strike can be dangerously destabilizing. The scenario-based analysis began with the assumption that U.S. airpower might be employed as it frequently has been in crises and conflicts since the end of the Cold War. In responding to crises such as those caused by Iraq's invasion of Kuwait in 1990, Serbian atrocities in Bosnia-Herzegovina in 1995, and Serbia's refusal to accept the Rambouillet Accords in 1999 (to name three prominent examples), U.S. leaders obtained basing rights in nearby countries and flowed high numbers of short-range strike aircraft into the theater. They also deployed carrier strike groups to adjacent waters. This approach served U.S. interests well during the era, if not for crisis stability, at least for winning the conflicts that resulted when stability failed. Posturing high numbers of strike aircraft close to the enemy allowed U.S. and coalition air forces to generate high sortie rates and put a significant amount of ordnance on targets, making important, sometimes singular, contributions to victory.

Force structure projections indicate that the United States will be able to continue with this approach for at least the next two decades if U.S. leaders choose to do so, but a structural stability analysis suggests that they should not want to posture forces this way in confrontations against a dangerous opponent. Until now, the United States and its coalition partners have enjoyed the luxury of fighting adversaries that largely lacked the capabilities to strike the bases and aircraft carriers from which short-range strike aircraft have flown. But in confrontations with opponents armed with the capabilities that future regional adversaries are expected to have, posturing strike forces close to them may be destabilizing.

Figure 3.2 illustrates the structural instability that results from posturing strike assets close to a dangerous opponent. In this example, F-35 advanced strike fighters available in the numbers used in the 2025–2030 scenario presented a potent threat to the opponent. They could generate high sortie rates and, when refueled just outside the surface-to-air missile (SAM) threat envelope, could hold a considerable

**Figure 3.2**  
**The Structural Instability That Results from Close Basing**



RAND MG1258-3.2

number of enemy targets at risk. However, posturing the U.S. strike force within range of a substantial portion of the opponent's conventional missile forces made it highly vulnerable to enemy surprise attack. At the same time, the short distances from U.S. bases and carriers to enemy targets resulted in short warning times for enemy forces and compressed decision times for enemy leaders—in other words, a substantial threat of U.S. surprise attack. This combination of threat and vulnerability virtually invites enemy preemption.

It is important to point out that these dynamics will not be as severe for carrier-based strike fighters as for those on land bases. Because aircraft carriers are mobile platforms, they will not be as vulnerable. To launch a preemptive attack against them, potential opponents would have to integrate a complex array of sensors, data processors, and command-and-control systems enabling them to detect, identify, track, and target the ships quickly enough to fire missiles before they move beyond the ranges of the weapons' terminal guidance systems. Some potential opponents have made substantial progress in efforts to develop such capabilities, and the analysis assumes that they would have them by the era of the scenarios. But how capable their

systems will actually be will depend on a wide range of factors beyond the scope of this analysis. While aircraft carriers will not be as vulnerable as close land bases, it is clear that they will not be able to operate as close to opponents in the future as they have in the past. Posturing them farther back in a crisis will reduce sortie rates, thereby reducing the potency of the deterrent threat they can bring to bear.

### **Non-Stealthy Bombers with Standoff Weapons**

Another capability that Air Force leaders plan to retain in the 2025–2030 time frame is that provided by legacy bombers, such as B-52s and B-1s, armed with standoff weapons. These assets are not expected to be survivable against future adversary air defenses, but they could deliver standoff weapons from just outside the threat envelope and therefore hold a number of targets at risk in a crisis. Unfortunately, this analysis indicates that deploying legacy bombers to a region in combination with close-based short-range strike fighters would not contribute to crisis stability. Figure 3.3 illustrates the dynamics that can emerge when non-stealthy bombers with standoff weapons are added to the crisis response along with short-range strike fighters.

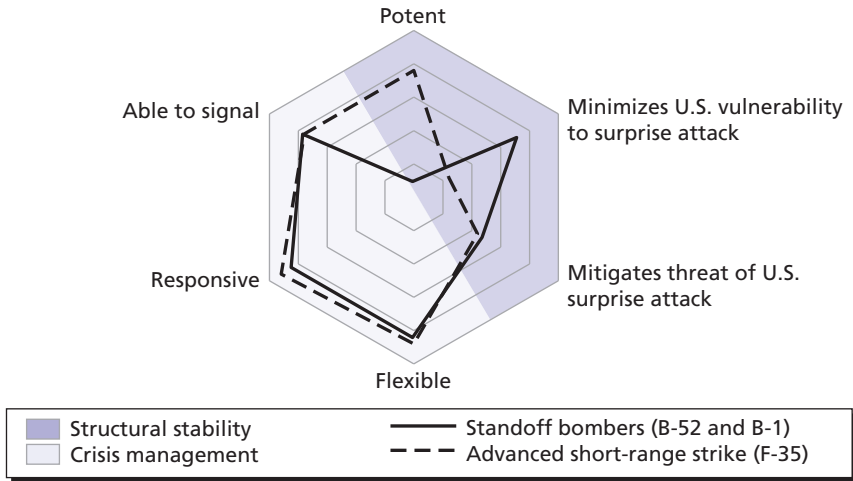
As the figure indicates, legacy bombers with standoff weapons would be relatively safe from surprise attack, being based beyond the range of the opponent's SRBMs and MRBMs. However, they would not contribute much to the potency of U.S. deterrent threats, at least not directly.<sup>2</sup> While standoff weapons, such as the AGM-158A Joint Air-to-Surface Standoff Missile (JASSM), could hold important fixed targets at risk, even the extended-range version (AGM-158B JASSM-ER) would have limited reach into the opponent's defended airspace, given the ranges of the advanced SAM systems that future adversaries are expected to have.<sup>3</sup> More seriously, due to the high costs of these

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<sup>2</sup> As explained later, if standoff weapons are used to take down key nodes in an opponent's IADS, they would increase the ability of other strike aircraft to reach their targets, thereby contributing to potency indirectly by increasing the potency of those strikers.

<sup>3</sup> JASSM is reported to have a range of more than 200 miles, and JASSM-ER is reported to have a range of more than 500 miles. Russia's S-500 Samoderzhets ("Autocrat") SAM system, expected to go into production by 2014, is projected to have a range of 373 miles. See "AGM-158A JASSM (Joint Air-to-Surface Standoff Missile), AGM-158B JASSM-ER,"

**Figure 3.3**  
**Close-Based Strike Fighters Supplemented by Bombers with Standoff Weapons**



RAND MG1258-3.3

munitions, Air Force inventories will be relatively small.<sup>4</sup> They would likely be expended in the first several days of fighting against a capable opponent. This, too, limits the weapon system's ability to impose a stabilizing deterrent threat.

Complicating matters, even though standoff bombers would not add much directly to the potency needed to deter an adversary from attacking, they could still present a substantial threat of U.S. surprise attack during a crisis. Standoff weapons could be massed and launched in salvos. A likely concept for employing these capabilities would be to use them as they have been used in previous conflicts: in sudden attacks against key coastal air defense installations and command-and-control nodes in the opponent's IADS. Such uses would pave the way for strike aircraft to penetrate contested airspace and carry out their

*Jane's Air-Launched Weapons*, January 22, 2010, and "Russia Set to Finish Development of New Air Defense System," *RIANOVOSTI*, September 16, 2009.

<sup>4</sup> For an analysis comparing the costs of cruise missiles to those of penetrating bombers, see Hamilton, 2011.

missions more effectively. Employed in this manner, standoff weapons would contribute to potency indirectly and probably in greater proportion than the simple calculation of their direct potency used in this study would suggest. However, if a large number of standoff bombers are put on patrol just outside the opponent's defended airspace during a crisis, opponent leaders might believe they are posturing for precisely this kind of surprise attack. This would only add to the opponent's anxiety about close-based U.S. strike fighters while doing nothing to lessen those fighters' vulnerability to mass missile raids. In this posture, enemy preemption might be even more likely than without the stand-off bombers.

### **The Effects of Moving Short-Range Strike Fighters Back**

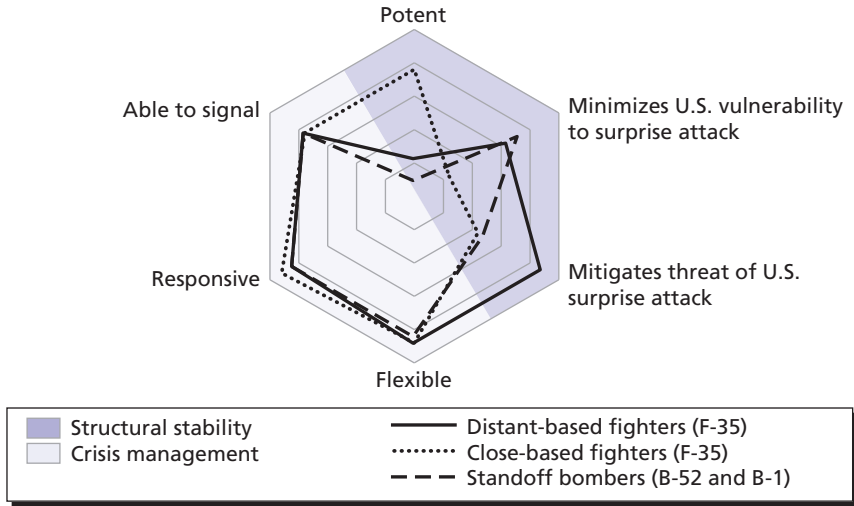
To reduce these vulnerabilities, joint commanders could move U.S. fighters to bases beyond the range of the opponent's SRBMs and MRBMs. With adequate tanker support, they could still use short-range strikers in combination with standoff bombers to threaten opponent targets. Figure 3.4 illustrates the configuration of attributes in this posture.

As the figure demonstrates, moving short-range strike fighters back would significantly reduce both sides' vulnerability to surprise attack. This would mitigate the threat of U.S. surprise attack substantially. The time spent in transit from bases to targets would increase opponent decision times and likely reduce anxieties over the threat of prompt, mass U.S. air attack.<sup>5</sup> More importantly, distant basing would also reduce the vulnerability of U.S. short-range strike assets to enemy surprise attack. It would increase warning time and put planes out of range of most of the opponent's missiles, leaving fewer for active and passive defenses to defeat. If distant basing were combined with dispersal to multiple locations, it would reduce the vulnerability to surprise attack even further.

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<sup>5</sup> The scenario assumed that the opponent had sufficient intelligence and warning assets to know when U.S. aircraft and ships were departing from and returning to bases and ports. The assumed assets include satellite reconnaissance imagery intelligence, signals intelligence, ocean surveillance, over-the-horizon radar, and human sources.

**Figure 3.4**  
**Distant-Based Strike Fighters Supplemented by Bombers with Standoff Weapons**



RAND MG1258-3.4

However, pulling short-range strike aircraft back would reduce potency significantly. Long distances to and from targets would force sortie rates down, resulting in less persistence in the attack. Given the fighters' limited payloads, low sortie rates would also substantially reduce the volume of ordnance put on targets over time. As a result, the strength of the U.S. deterrent threat would be diminished, even if distant-based short-range strike aircraft were postured in combination with standoff bombers. An aggressive, risk-tolerant opponent might attack a nearby state with the assumption the United States would be unable to muster an effective defense from afar.

### The Effects of Penetrating Bombers

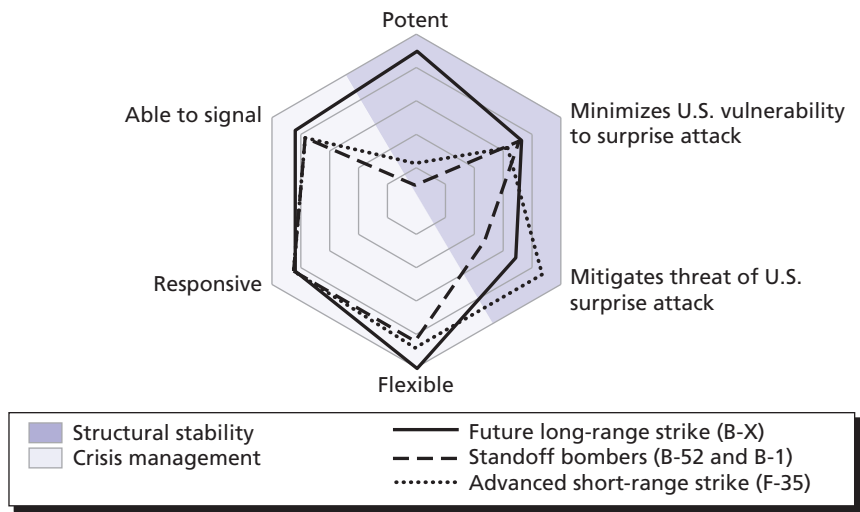
The foregoing analysis illuminates a pivotal dilemma in crisis management: Posturing forces close to an opponent generates a potent coercive threat, but it also exposes both sides to the vulnerability of surprise attack in ways that encourage preemption. Alternatively, posturing strike assets at distant bases reduces both sides' vulnerability to surprise

attack, but it also makes it difficult to generate a conventional threat that is potent enough to deter an aggressive opponent from attacking. It is important to emphasize that this dilemma will apply to all strike fighters to some extent, whether land- or sea-based, when potential opponents acquire the intelligence, surveillance, and reconnaissance (ISR) and precision strike capabilities needed to find and target aircraft carriers.

Penetrating long-range bombers (i.e., aircraft with sufficient range and payload to operate effectively from distant bases and with sufficient passive and active defenses to survive in the opponent's defended airspace) offer a solution to this dilemma. Figure 3.5 illustrates what penetrating bombers can contribute to structural stability.

This figure reflects the attributes of penetrating bombers postured at distant bases in the scenario region. The attribute profiles of distant-based strike fighters and standoff bombers are also provided

**Figure 3.5**  
**Penetrating Bombers, Distant-Based Strike Fighters, and Standoff Bombers**



for comparison.<sup>6</sup> As the figure indicates, penetrating bombers generate a potent deterrent threat without exposing U.S. forces to inordinate vulnerability to surprise attack. Distant basing would also mitigate the threat of U.S. surprise attack, although the bombers' stealthy characteristics and deep reach into the opponent's defended airspace would make them more threatening than strike fighters operating from the same ranges. This threat, as well as that generated by the salvo capabilities of standoff bombers, could be managed by coordinating tactics within a broader crisis management strategy. Substantial numbers of standoff and penetrating bombers could be deployed to regional bases to generate a deterrent threat but kept well away from the opponent's defended airspace to mitigate the threat of surprise attack. Should U.S. leaders decide that it is necessary to intensify the threat, bomber patrols could be moved closer to the opponent or increased in number and frequency.

In sum, penetrating bombers are rich in the qualities needed to effectively coordinate military operations with such nuanced crisis management strategies.

### **Airpower Tools for Crisis Management**

All the aircraft types examined in this analysis offer excellent tools for crisis management. As Figures 3.2 through 3.5 consistently illustrate, bombers and fighters both excel in flexibility, responsiveness, and ability to signal. Aircraft can cover great distances in any direction quickly, free of obstruction by surface terrain. This central feature of airpower allows bombers and fighters of all types, whether land-based or sea-based, to be both flexible and responsive.

Modern combat aircraft are designed to maximize those advantages. Aircraft can be flushed quickly and deployed to bases in distant theaters in hours. They can carry a large assortment of weapons, enabling them to create a wide variety of effects in the battlespace,

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<sup>6</sup> The proportion of bombers to fighters was consistent with that projected in Air Force future planning scenarios. Carrier-based aircraft would add to short-range fighter potency in degrees proportionate to however many carrier strike groups (CSGs) are within employment range at the onset of the crisis and deployable over time.



both kinetic and nonkinetic. Missions can be redirected and weapons can be reprogrammed in flight. Aircrews can receive and act on fire and hold-fire orders almost instantly. These capabilities allow aircraft to be employed in a variety of operational profiles, making them useful across a wide range of scenarios. As a result, bombers and fighters offer crisis managers capable tools for signaling U.S. levels of concern and sending discernible messages to friends and opponents alike.

Missile strike assets do not exhibit these qualities as strongly or as consistently as aircraft.

### **The Role of Conventional Missiles in Crisis Management**

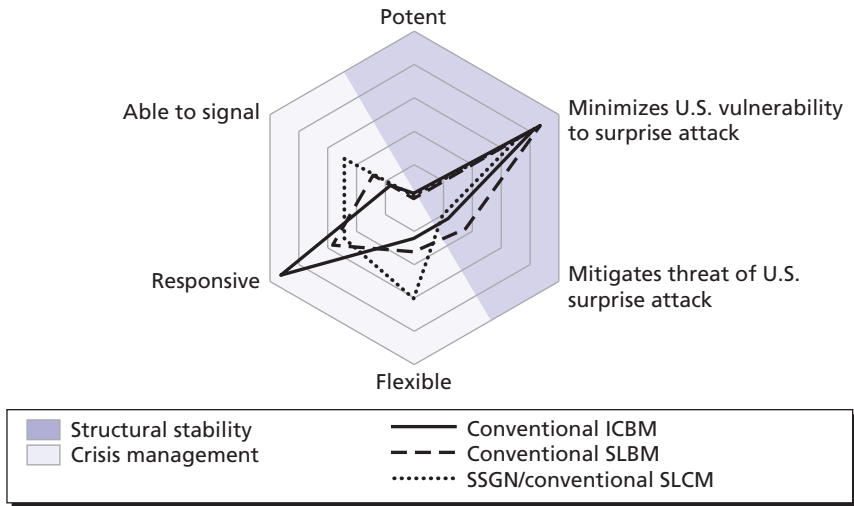
This analysis also examined the structural stability and crisis management attributes of two future concepts that the U.S. Department of Defense is considering for conventional ballistic missile deployment and a conventional cruise missile system now in service. The systems examined were an Air Force concept for silo-based, conventional intercontinental ballistic missiles (ICBMs); a Navy concept for conventional submarine-launched ballistic missiles (SLBMs); and sea-launched cruise missiles (SLCMs) currently operating on four guided-missile submarines (SSGNs).

Those who advocate for these systems do not propose that they be used for crisis management. Rather, conventional ICBMs and SLBMs are alternative concepts for attaining the Prompt Global Strike capabilities that proponents argue are needed to hold fleeting targets at risk, such as terrorist leaders or a North Korean nuclear missile on the launch pad.<sup>7</sup> SSGNs, conversely, are part of the nation's existing war-fighting capabilities. Nonetheless, if such strike capabilities exist, or if they are added, their potential effects on structural stability and utility for crisis management should be considered. Figure 3.6 illustrates the structural stability and crisis management attributes of these systems.

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<sup>7</sup> Craig Whitlock, "U.S. Looks to Nonnuclear Weapons as Deterrent," *Washington Post*, April 8, 2010; Elaine Grossman, "Science Panel Backs Conventional Trident Missile," *Government Executive*, August 15, 2008; Elaine Grossman, "Air Force Proposes New Strike Missile," *Military.com*, April 8, 2006. Prompt Global Strike is the name of a U.S. initiative to develop a conventional weapon system with the ability to strike any target within one hour.

**Figure 3.6**  
**Conventional Missiles: ICBMs, SLBMs, and SLCMs**



RAND MG1258-3.6

As the figure indicates, conventional missiles are strong in certain attributes but weak in others. These systems' greatest advantage rests in their survivability, which makes them all but invulnerable to conventional surprise attack. Submarines are stealthy platforms when at sea, difficult to find and difficult to defeat even when located. Although submarines are vulnerable in port, the ports would be out of range of nearly all of the opponent's strike assets, and it is reasonable to assume the submarines would put to sea early in the crisis, before the threat of surprise attack is very high. Conventional ICBMs, on the other hand, would be stationary targets before launch throughout the crisis. But based in the continental United States (CONUS) in hardened silos, they too would be relatively invulnerable to enemy attack. They would only be at risk of surprise kinetic attack should an opponent opt for strategic nuclear preemption, an unlikely decision given U.S. retaliatory capabilities.

ICBMs were the most responsive of all systems evaluated in this study. In constant contact with higher headquarters, the missiles could

be launched very quickly and reach targets in 20–30 minutes. Submarines are usually in constant contact with launch authorities as well, but it takes days or longer for them to reach mid-ocean patrol stations from CONUS bases or redeploy to firing positions in different theaters. This reduced their responsiveness scores in the analysis.

Where conventional missiles suffered as crisis management tools was in their limited flexibility and ability to signal. All three systems were restricted in the range of scenarios in which they could be employed and the kinds of attacks and weapon effects they could create. Similarly, while flushing submarines from port or putting ICBMs on alert could be useful in signaling U.S. concern during a crisis, little more could be done with these systems after that to send discernible messages to the opponent.<sup>8</sup>

Where conventional ballistic missiles raise the most concern, however, is in their potential effects on structural stability. With no visible indications they are about to be launched, their short flight times, and their long reach into the opponent's territory, conventional ICBMs and SLBMs would pose a significant threat of U.S. surprise attack. Opponents might fear that these missiles would be used in an attempted decapitation strike or a strike against critical assets, such as nuclear command-and-control nodes. At the same time, however, small weapon loads and a lack of timely reload capabilities would make their potency very low. Consequently, they would be ineffective as warfighting weapons.

This low potency—so low compared to aircraft, in fact, that it is barely discernible on comparative radar plots—makes it highly

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<sup>8</sup> It should be noted that SSGNs did score somewhat higher than SSBNs (ballistic missile submarines) or ICBMs in flexibility and ability to signal. For instance, in July 2010, three SSGNs surfaced nearly simultaneously in Western Pacific and Indian Ocean waters, allegedly to signal U.S. displeasure over Chinese missile tests in the East China Sea. This demonstrated that these platforms offer signaling capabilities that other conventional missile systems lack. Conventionally armed SSBNs would not be used in this way because, according to current Navy concepts, they would also carry nuclear-armed missiles. Therefore, U.S. authorities would not want to reveal their locations. Yet, one might doubt whether U.S. leaders would even allow SSGNs to surface while on patrol in an engagement zone during a crisis when doing so might put them at risk of attack. See Greg Torode, "U.S. Submarines Emerge in Show of Military Might," *South China Morning Post*, July 4, 2010, and Grossman, 2008.

unlikely that these weapons would contribute to deterrence. On the other hand, given their low potency and their relative invulnerability to conventional surprise attack, it is not clear that they would be destabilizing. However, critics worry that a nuclear-armed opponent or even a third party might mistake the launch of conventional ballistic missiles for a nuclear attack. Proponents, conversely, argue that these risks can be mitigated by modified flight profiles, separate basing for conventional ICBMs, and international monitoring or other confidence-building measures for conventional SLBMs.<sup>9</sup> Assessing the merits of each position and the overall merits of each system was beyond the scope of this study. However, it can be said that conventional ICBMs and SLBMs would offer little, if anything, to structural stability or crisis management.

Conventional SLCMs, on the other hand, have proven to be valuable warfighting assets. They have been used in past conflicts to attack key enemy IADS nodes, thus paving the way for strike aircraft to penetrate contested airspace and execute their missions. Thus, like standoff weapons on legacy bombers, SLCMs contribute more to the potency of U.S. threats indirectly, by making strike aircraft more effective, than any direct calculations of their potency based on numbers, payload, and range would suggest. And like air-delivered standoff weapons, SLCMs could contribute to the instability created by close-based fighters—in fact, the opponent's anxieties might be magnified by the ability of SSGNs to posture in stealth nearby—or they could contribute to the stability created by distant-based penetrating bombers by making those aircraft even more potent.

## **Implications for Crisis Management and Structural Stability**

Taken together, these findings suggest that, of the strike assets examined in this study, aircraft offer decisionmakers the most capable tools for crisis management, and penetrating bombers are the aircraft most

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<sup>9</sup> Grossman, 2008.

richly endowed with the attributes needed to maintain structural stability. No other conventional strike assets offer comparable potency for deterring an adversary attack without being exposed to preemption.

This does not suggest that penetrating bombers or even aircraft more broadly should be the only strike assets postured in future crises or employed in future wars. Cruise missiles will doubtless continue to be valuable assets. Whether delivered by legacy bombers or submarines, they can be important enablers for penetrating aircraft. But conventional missiles lack the potency to project credible deterrent threats independently, without aircraft postured to follow up on the openings they create. Strike fighters, in turn, can generate very potent threats, but only when postured in ways that make both sides dangerously vulnerable to surprise attack.

Penetrating bombers offer high levels of potency from more survivable postures than those possible with strike fighters. Bombers offer a host of qualities that decisionmakers will need to manage confrontations with dangerous opponents and resolve them on terms favorable to the United States. That is, at least, what the comparative analysis of strike system attributes would suggest. The question is whether the historical record offers evidence supporting these findings. Chapter Four endeavors to find out.

## Strike Systems and Crisis Stability in History

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Results of the analysis in Chapter Three indicated that aircraft and, particularly penetrating bombers, possess important attributes that will likely be needed to effectively manage future confrontations with dangerous states. However, that analysis was largely theoretical, so a review of the empirical record is warranted to determine the extent to which the dynamics predicted in Chapter Three have influenced the outcomes of historical cases. This chapter undertakes that task. It examines 48 cases in which states have confronted one another since the end of World War II to determine how strike assets were postured or used. It then assesses the effects on structural stability and crisis management outcomes. If the results of the foregoing analysis are valid, these cases should exhibit characteristics that support the following propositions:

1. Combat aircraft are the strike asset of choice in efforts to manage international crises and accomplish coercive objectives.
2. When aircraft are postured in ways that impose a potent deterrent threat without being vulnerable to surprise attack, crises are stabilized and coercive objectives are obtained.
3. Success in crisis management and coercive diplomacy most often goes to the actor that postures bombers.

Case Selection and Analytical Approach

This study examined how bombers, strike fighters, and missiles were postured and employed in 48 international crises.<sup>1</sup> A list of cases selected for the analysis is provided in Table 4.1.

Table 4.1  
Selected International Crises Since World War II

Crisis	Year	Crisis	Year	Crisis	Year
Yugoslavia	1946	Sino-Soviet	1969	Iraq	1991
Kashmir	1947–1949	Bomber Deployment	1969	Korean Nuclear	1993–1994
Berlin	1948–1949	<i>Pueblo</i> Incident	1968	Iraq	1994
Korea	1950a	Black September	1970	Bosnia	1995
Korea	1950b	Bangladesh	1971	Taiwan Strait	1995–1996
Bomber Deployment	1951	Yom Kippur	1973a	Iraq	1999
Taiwan Strait	1954	Yom Kippur	1973b	Kargil	1999
Suez	1956a	Belize	1975	Kosovo	1999
Suez	1956b	Poplar Tree Incident	1976	Hainan Incident	2001
Taiwan Strait	1958	Sino-Vietnamese	1979	Indo-Pakistani	2001
Berlin	1961	Iran	1979–1980	Iraq	2003
Sino-Indian	1962	Falklands/Malvinas	1982a	Korean Nuclear	2003
Cuba	1962	Falklands/Malvinas	1982b	Korean Missile	2006–2007
Arab-Israeli	1967	Grenada	1983	Georgia	2008
Kashmir	1965	Panama	1989–1990	Indo-Pakistani	2008
EC-121 Shootdown	1969	Iraq	1990	Yomp’yong-do	2010

<sup>1</sup> See Appendix C for the criteria used to select the cases. The data set includes two cases, the 1967 Arab-Israeli crisis and the 1973a Yom Kippur crisis, that did not meet all the case selection criteria because none of the participants was among the six most powerful states in the world. They were added for illustrative purposes because they so clearly demonstrate the instability that results when adversaries base potent strike assets close to each other. Since these crises did not meet the case selection criteria, they are not included in the calculation of statistical significance applied to the predictive analysis, presented later in this chapter.

Of the 48 cases examined, 38 can be described as international crises in the classical sense of the term. That is, peacetime confrontations between states approached the brink of war or ongoing wars approached a serious escalation threshold, such as great power intervention or the use of nuclear weapons. To these 38 cases, three more were added in which the United States brandished long-range strike assets for signaling to forestall crises believed to be looming.<sup>2</sup> The U.S. goal in these cases was to deter opponents from taking actions that might have resulted in international crises.<sup>3</sup> The 41 cases were divided into two categories based on whether nuclear or conventional weapons most influenced their outcomes. The remaining seven cases involved confrontations that culminated with the United States or a U.S.-led alliance or coalition imposing a military solution on a much weaker opponent. While U.S. leaders did not seek stability in these crises, they are included in the analysis because they offer additional insights regarding the dynamics that long-range strike capabilities generate in coercive diplomacy.<sup>4</sup>

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<sup>2</sup> The word *brandish* refers to any behavior that is meant to communicate a threat. A state brandishes a strike asset when it overtly raises its alert status, deploys it to a forward base, puts it on patrol in a forward area, or explicitly threatens to employ it.

<sup>3</sup> The three signaling cases are Bomber Deployment 1951; Bomber Deployment 1969; and Iran 1979–1980. In 1951, concerned about the United States being tied down in Korea, President Harry S. Truman had the Strategic Air Command deploy B-29s to Britain and Guam to deter the Soviet Union and China from aggressive behavior in Europe and Asia. In 1969, President Richard Nixon had the Strategic Air Command deploy B-52s to Alaska and ordered them to patrol the Soviet border to demonstrate U.S. commitment to do whatever it would take to win the Vietnam War. In 1979 and 1980, U.S. B-52s flew patrols over the Black Sea to deter the Soviet Union from trying to exploit the instability in the Middle East that resulted from the Iranian Revolution. See Roger Dingman, “Atomic Diplomacy During the Korean War,” *International Security*, Vol. 13, No. 3, Winter 1988–1989; Therese Delpech, *Nuclear Deterrence in the 21st Century: Lessons from the Cold War for a New Era of Strategic Piracy*, Santa Monica, Calif.: RAND Corporation, MG-1103-RC, 2012, pp. 78–79; and Rebecca Davis Gibbons, “Signals Intelligence: The Effectiveness of Nuclear and Nonnuclear Signals in a Crisis,” *Nuclear Scholars Initiative: A Collection of Papers from the 2011 Nuclear Scholars Initiative*, Washington, D.C.: Center for Strategic and International Studies, December 2011.

<sup>4</sup> U.S. analysts compiling lists of international crises sometimes overlook these cases because they did not generate high levels of threat to the United States. However, all of them involved extended militarized confrontations generating high levels of threat to opponents



With the relevant cases identified, the study team examined the events in each case to determine what strike assets each participant possessed during the crisis, whether those assets were based within the striking range of other opponents, and whether participants brandished them during the crisis. The study team also recorded whether each case ended in stability or war and, if stabilized, which of the participants the outcome favored. For those cases that ended in war, the researchers considered the strike assets employed by the opponents and which state or states ultimately won those conflicts. Once all of the data were gathered and coded, the team identified relationships between strike system postures and the outcomes of crisis management, coercive diplomacy, and war. See Appendix C for a more detailed description of the case selection and analysis methodology and a table displaying the raw data.

## Findings of the Case Study Analysis

### National Leaders Rely on Aircraft to Stabilize International Crises

As predicted, since World War II, aircraft have been the strike asset that national leaders most frequently turned to in efforts to manage international crises, confirming the first proposition listed at the beginning of this chapter. Table 4.2 shows the strike assets brandished in the 48 cases examined, classifying the cases into five categories: nuclear, 1945–1959; nuclear, 1960–2010; conventional, 1945–1979; conventional, 1980–2010; and compellence. The column labeled “State(s) A” lists the number of cases in which aircraft or missiles were brandished by the state or states whose actions constituted the proximate cause of the crisis.<sup>5</sup> The “State(s) B” column lists the number of cases in which

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facing the United States and its partners. From the opponents’ perspectives, they were indeed crises, and several were so severe that they threatened regime survival. Consequently, these cases are among those listed in the crisis database maintained by the International Crisis Behavior Project at the University of Maryland’s Center for International Development and Conflict Management. (See Center for International Development and Conflict Management, International Crisis Behavior Project database, data as of March 26, 2012.)

<sup>5</sup> In focusing on *proximate* causes, the analysis acknowledges that many of the cases examined involved a series of escalating provocations by both sides. Nonetheless, State A’s actions

**Table 4.2**  
**Cases in Which Aircraft or Missiles Were Brandished**

Case Type	State(s) A		State(s) B		Total	
	Aircraft	Missiles	Aircraft	Missiles	Aircraft	Missiles
Nuclear 1945–1959	0	0	3	1	3	1
Nuclear 1960–2010	1	2	7	4	8	6
Conventional 1945–1979	6	0	8	0	14	0
Conventional 1980–2010	5	4	8	3	13	7
Compellence	5	5	1	1	6	6

NOTE: The sum of the strike assets brandished exceeds the total number of cases because, in many crises, more than one kind of strike asset was brandished.

aircraft or missiles were brandished by states opposing the provocative actions of State A(s) and attempting to stabilize the crises on their terms.

Due to differences between cases and advances in technology across the period examined, the data must be organized by case type and time period to allow meaningful interpretation. Up until about 1960, neither the United States nor the Soviet Union had ICBMs or SLBMs, so nuclear threats involved bombers almost exclusively.<sup>6</sup> After around 1960, however, both superpowers had ICBMs and, later, SLBMs, in addition to bombers. Similarly, up until about 1980, precision-guidance technology was not available for missiles, and it was all but impossible to project potent threats with these weapons armed

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supplied the trigger event that threatened war or a dramatic escalation of an ongoing conflict. In most cases, State B was most interested in stabilizing the resulting crises, but in some, both sides were eager to reduce tensions.

<sup>6</sup> The one missile threat case in that period was the 1956 Suez crisis, in which Moscow dispatched harsh notes to London, Paris, Tel Aviv, and Washington threatening “dangerous consequences” if the British, French, and Israelis did not terminate hostilities. The recipients of this communiqué took it to be a threat against Europe and Israel with nuclear-armed missiles.

with conventional warheads alone. From 1980 onward, however, precision-guidance technology made ballistic and cruise missiles more capable, and the case records reflect these advances.

Yet, as the data indicate, even in periods in which nuclear-armed missiles and conventional PGMs were available, states attempting to stabilize international crises brandished aircraft more often than missiles. Between 1960 and 2010, State B actors brandished aircraft, usually bombers, in seven nuclear crises and missiles in four. In all four cases in which missiles were brandished, aircraft were brandished as well. The difference is even more notable in PGM-era conventional crises, in which aircraft were brandished in eight cases and missiles were brandished in three. Only in cases in which State A actors were disproportionately powerful and determined to impose a solution on their State B opponents (those labeled “Compellence”) were aircraft and missiles brandished in equal proportions.

Some of the reasons for the disproportionate reliance on aircraft to stabilize nuclear and conventional crises go beyond the attributes examined in Chapter Three. For instance, in a high percentage of the cases examined, the State B actors that attempted to stabilize the crises were the United States and its allies or Western coalition partners, and the State A actors were the Soviet Union or its client states. Throughout the Cold War, the United States and its partners relied more heavily on airpower than did the Soviet Union and its clients. Soviet leaders did not pursue airpower as ardently, partly because the United States held the advantage in this field, particularly bomber technology early in the Cold War.<sup>7</sup>

Yet, these considerations are not completely separate from those outlined in the attribute analysis in Chapter Three. For the United States, crisis management almost always required quickly projecting force from afar in ways that were visible to opponents and to locations that were often difficult to predict. Among the reasons U.S. leaders continued to invest heavily in aircraft even after nuclear-armed mis-

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<sup>7</sup> R. A. Mason, “The Contribution of Air Power to Soviet Strategic Objectives,” in *Transformation in Russian and Soviet Military History: Proceedings of the Twelfth Military History Symposium*, Colorado Springs, Colo.: U.S. Air Force Academy, 1986.

siles and precision-guided conventional missiles were available was that aircraft had a high degree of flexibility, visibility, and conventional potency that missiles lacked. As further analysis reveals, U.S. investments in airpower ultimately paid high dividends.

### **Long-Range Strike Aircraft Impose a Powerful Stabilizing Force**

The case record also strongly supports the second proposition drawn from findings of the attribute analysis. When states seeking to avoid war postured aircraft in ways that imposed a potent deterrent threat without being vulnerable to surprise attack, those states consistently managed to stabilize crises, and they usually did so on their terms.

Once again, however, one must divide the cases by type to interpret the record correctly, because those in which nuclear brandishing occurred, or the participants feared it would occur, exhibited different dynamics from those in which conventional weapons had the greatest effect on crisis stability. Table 4.3 illustrates the relationship between strike asset postures and stability in each nuclear crisis.

The table organizes data pertaining to the ten nuclear crises and three cases of nuclear signaling examined in this study. Although conventional fighting occurred in four of these cases, nuclear crisis stability was maintained in all 13.<sup>8</sup> In 11 cases, State B actors were able to project a nuclear threat from a position that was safe from preemption, either because State A actors lacked weapons capable of reaching these positions or because both sides were vulnerable to a counterstrike, making a surprise attack too costly for either side. The latter condition may also have been present in the 12th case, the 2001 Indo-Pakistani crisis, but it is unclear whether Indian and Pakistani nuclear forces achieved sufficient second-strike survivability during this period to make them safe from preemption.

In any event, it is important to note that State B actors brandished bombers in seven cases, and the outcomes favored their interests in five, with the other two cases yielding mixed outcomes. When State B actors did not brandish bombers, they achieved their interests

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<sup>8</sup> Conventional fighting led to the 1956 Suez crisis, the 1969 Sino-Soviet crisis, the 1973 Yom Kippur crisis, and the 1999 Kargil crisis.

**Table 4.3**  
**Strike Asset Postures and Outcomes of Nuclear Crisis and Signaling Cases**

Case	State(s) A	Strike Assets			Safe?	State(s) B	Strike Assets			Safe?	Outcome	Outcome Favored
		B	F	M			B	F	M			
Yugoslavia 1946	Yugoslavia		Pr		No	USA	Br			Yes	Stabilized	B
Bomber Deployment 1951	USSR	Pr	Pr		No	USA	Br			Yes	Stabilized	B
Berlin 1948–1949	USSR	Pr	Pr		No	USA	Br			Yes	Stabilized	B
Suez 1956b	Britain, France, Israel		Em		No	USA, USSR			Br	Yes	Stabilized	B
Berlin 1961	USSR	Pr	Pr	Pr	Yes (MV)	USA	Pr	Br	Pr	Yes (MV)	Stabilized	A
Cuba 1962	USSR	Pr		Br	Yes (MV)	USA	Br	Br	Br	Yes (MV)	Stabilized	Mixed
Sino-Soviet 1969	PRC	Pr	Pr		No	USSR	Pr	Br	Br	Yes	Stabilized	B
Bomber Deployment 1969	USSR	Pr	Pr	Pr	Yes (MV)	USA	Br		Pr	Yes (MV)	Stabilized	B
Yom Kippur 1973b	USSR				Yes (MV)	USA	Br		Br	Yes (MV)	Stabilized	Mixed
Iran 1979–1980	USSR	Pr	Pr	Pr	Yes (MV)	USA	Br		Pr	Yes (MV)	Stabilized	B
Kargil 1999	Pakistan		Pr	Pr	No	India		Em	Pr	No	Stabilized	B
Indo-Pakistani 2001	Pakistan		Br	Br	Unclear	India		Br	Br	Unclear	Stabilized	Mixed
Indo-Pakistani 2008	Pakistan		Pr	Pr	Yes (MV)	India		Pr	Pr	Yes (MV)	Stabilized	Mixed

NOTE: PRC = People's Republic of China. B = bombers. F = strike fighters. M = missiles. MV = mutual vulnerability. Br = brandished. Em = employed. Pr = present

in three cases and were met with mixed outcomes in two more. No State A actor brandished bombers in any of these cases, and only one case ended in a favorable outcome for that side: the 1961 Berlin crisis. Notably, this was the first case in which the Soviet Union had ICBMs to threaten the U.S. homeland, although Moscow did not brandish them. The United States deployed fighters to Germany during this crisis, but it did not brandish bombers or missiles.

When considering these data, it is important to remember that the dynamics of crisis stability differ when the homelands of *both* opponents can be threatened by nuclear weapons. Until about 1960, the United States could safely threaten the Soviet Union by posturing bombers beyond the range of Soviet strike forces. But the foundation for U.S.-Soviet stability changed when the Soviets gained the ability to hold the United States at risk with nuclear-armed ICBMs. From the 1961 Berlin crisis onward, each side could threaten the other's homeland with nuclear destruction. As explained in Chapter Two with regard to the Cuban missile crisis, this imposed a stabilizing damper on all subsequent U.S.-Soviet confrontations. As a result, U.S. and Soviet strike assets were safe from preemption in all direct confrontations between those states from the 1961 Berlin crisis onward, and such direct confrontations became rare.

A similar dynamic can be seen in Indo-Pakistani relations. After gaining independence in 1947, confrontations between those states generated a series of crises, several of which resulted in war (as shown on Table 4.5 later in this chapter). In 1998, however, both countries demonstrated that they had developed nuclear weapons. By 2001, when a terrorist attack on India's Parliament brought them into confrontation once again, their nuclear capabilities were sufficiently developed that it was questionable whether either could launch a major conventional attack on the other without risking a nuclear reprisal. As a result, although both sides mobilized ground forces on the border and brandished conventional and nuclear strike assets, the crisis remained stable long enough to be resolved through diplomacy and U.S. media-

tion.<sup>9</sup> Seven years later, when another series of terrorist attacks rocked Mumbai, both sides understood their mutual vulnerabilities and neither brandished strike assets, conventional or nuclear.<sup>10</sup>

While the nuclear cases are informative, they do not constitute the most important category in this analysis. When mutually vulnerable near-peer states brandish nuclear weapons in a crisis, they tend to become very cautious, regardless of which vehicles are postured to deliver them. Once opponents have experienced such harrowing crises, they tend to avoid them in the future. Therefore, while future bilateral confrontations between major nuclear states will always need careful management, the more likely and potentially more dangerous scenarios are those in which emergent nuclear powers, overestimating the freedom that such weapons grant them for conventional aggression, attempt to force changes in the local status quo, provoking confrontations with the United States or U.S. allies or friends in the region. When the United States intervenes in such circumstances, the regional nuclear powers could become frightened and unpredictable, resulting in rapid escalation to nuclear brandishing or nuclear weapon use. Therefore, U.S. leaders will need to forestall or stabilize these crises early in their development by posturing conventional forces in ways that deter escalation.

Understanding the history of conventional crisis management is thus very important, particularly those cases in which at least one belligerent was a nuclear-armed state. Table 4.4 organizes the data pertaining to the 15 cases in which strike assets were postured in the successful management of a conventional crisis.

As in Table 4.3, the column labeled “State(s) A” lists the state or states whose action constituted the proximate cause of the crisis. The “State(s) B” column lists the state or states that opposed State A’s provocative action and attempted to stabilize the crisis. Other columns

<sup>9</sup> For a closer look at the escalation dynamics in this case and the 1999 Kargil crisis, see Morgan et al., 2008, pp. 97–106.

<sup>10</sup> Indian and Pakistani leaders have since referred to the 2001 episode as their “Cuban missile crisis,” “a confrontation that came so close to catastrophe that it shocked both sides into a new approach to nuclear deterrence, one that is grounded in military restraint, political patience, and negotiations about underlying grievances” (Coll, 2006).

**Table 4.4**  
**Strike Asset Postures and Outcomes of Successful Conventional Crisis Management Cases**

Case	State(s) A	Strike Assets				State(s) B	Strike Assets				Outcome Favored
		B	F	M	Safe?		B	F	M	Safe?	
Taiwan Strait 1954	PRC		Pr		No	USA	Br	Br		Yes	B
Taiwan Strait 1958	PRC		Pr		No	USA	Br	Br		Yes	B
<i>Pueblo</i> Incident 1968	North Korea	Pr	Pr		No	USA		Br		Yes	Mixed
EC-121 Shootdown 1969	North Korea	Pr	Pr		No	USA		Pr		Yes	Mixed
Black September 1970	Syria		Pr		No	Jordan, USA		Br		Yes	B
Belize 1975	Guatemala		Pr		No	Britain		Br		Yes	B
Poplar Tree Incident 1976	North Korea	Pr	Pr		No	USA	Br	Br		Yes	Mixed
Iraq 1990	Iraq	Br	Br	Br	No	USA	Br	Br	Br	Yes	B
Korean Nuclear 1993–1994	North Korea	Pr	Pr		Yes	USA		Pr		Yes	Mixed
Iraq 1994	Iraq		Pr	Pr	No	USA		Br	Br	Yes	B
Taiwan Strait 1995–1996	PRC		Br	Br	Yes	USA		Br		Yes <sup>a</sup>	B
Hainan Incident 2001	PRC	Pr	Pr	Pr	Yes	USA				—	Mixed
Korean Nuclear 2003	North Korea	Pr	Pr	Pr	Yes	USA	Br	Br		Yes	A
Korean Missile 2006–2007	North Korea	Pr	Pr	Br	Yes	USA	Br	Br		Yes	A
Yomp'yong-do 2010	North Korea		Br	Pr	Yes	ROK, USA		Br		ROK: No USA: Yes	A

NOTE: ROK = Republic of Korea. B = bombers. F = strike fighters. M = missiles. Br = brandished. Em = employed. Pr = present. — = not applicable.

<sup>a</sup> In December 1995, at the height of tensions during this case, the USS *Nimitz* CSG transited the Taiwan Strait, during which it was vulnerable to a surprise attack by Chinese cruise missiles and aircraft. However, the USS *Independence* CSG, also deployed to waters near Taiwan for the crisis, was relatively safe from attack, as were U.S. land-based strike aircraft in the region, due to limits on Chinese air and missile strike capabilities during that era. Therefore, overall, U.S. strike assets were safe from preemption.



show the strike assets that each side postured before or during the crisis and whether those assets were safe from surprise attack. The far right column indicates which state (or states) the outcome of each case favored.

The first point that stands out is that, in almost every case, State B opponents postured strike assets in ways that kept them safe from surprise attack. In most cases, the assets that State B opponents postured were aircraft. They brandished bombers in six cases and strike fighters in 13, often with overlap. State B opponents brandished missiles in only two cases, and in both, aircraft were also postured: bombers in one and fighters in both.

Conversely, State A's strike assets were safe from surprise attack in only six of 15 cases. Although State A actors almost always had aircraft or missiles based within striking range of their opponents' ground targets, they brandished bombers in only one case, strike fighters in three cases, and missiles in three cases. Their reluctance to brandish these weapons during the crises was likely a reflection of State B actors' strong air defenses and the ability to hold State A targets at risk from positions that were safe from preemption.

Of the 15 cases examined, seven were stabilized on terms that favored State B opponents' interests, and five ended in mixed outcomes. State A actors achieved favorable outcomes in only three cases. Interestingly, the State A actor that was almost always able to attain a favorable or mixed outcome was North Korea. This suggests that factors outside those examined here may have influenced these outcomes, such as Pyongyang's penchant for erratic behavior and Seoul's proximity to heavy concentrations of North Korean ground forces, making U.S. and South Korean leaders chary of pressing demands too ardently during confrontations.<sup>11</sup>

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<sup>11</sup> Also note that North Korea is coded as not safe from a surprise attack in cases occurring in the 1960s and 1970s but safe from a surprise attack in cases occurring in the 1990s onward. By that time, the North Korean Air Force was sufficiently large, dispersed at bases with hardened shelters, and protected by a sophisticated IADS that preemptive attack ceased to be a viable option for opponents. Even in the earlier cases, however, Pyongyang's relations with Beijing and Moscow, and Seoul's vulnerability to North Korean ground forces, made North Korea an unattractive target for a surprise attack.

The importance of posturing strike assets in ways that secure them from surprise attack can be seen more starkly in crises that have resulted in war. Table 4.5 shows the relationships between strike asset postures, structural instability, and war outcomes in cases of failed conventional crisis management.

The table organizes the data pertaining to the 14 cases examined in which conventional crisis management failed. In each of these instances, either a peacetime confrontation resulted in war or a small conflict escalated into a much larger one. As in Tables 4.2–4.4, the column labeled “State(s) A” lists the state or states whose action constituted the proximate cause of the crisis. The “State(s) B” column lists the state or states that opposed this provocation and attempted to stabilize the crisis. Other columns show the strike assets that each side postured during the crisis or employed during the war and whether those assets were safe from surprise attack. The far right column indicates which side ultimately prevailed in the conflict.

These data offer strong support for proposition 2 in the inverse: When aircraft are *not* postured in a way that imposes a potent deterrent threat, or if they are postured in a way that makes them *vulnerable to surprise attack*, crises are *not* stabilized and coercive objectives are *not* obtained. In 11 of the 14 cases in which interstate crises devolved into war, State B opponents either did not posture aircraft in a way that imposed a threat potent enough to deter their enemies or, in doing so, failed to keep them safe from surprise attack. In 11 cases, State A opponents were also vulnerable to surprise attack.

The 1967 Arab-Israeli War and the 1973 Yom Kippur War provide archetypal examples of the structural instability that results when both sides’ strike assets are potent but vulnerable to surprise attack.<sup>12</sup> In each of these cases, tensions rose for several months between Israel and an Egyptian-led Arab coalition, during which both sides readied their military forces for war. In both cases, the Egyptian Air Force had bombers, but due to the region’s political geography—relatively small states with opponents sharing contiguous borders—each side’s strike aircraft could reach the other’s airfields and other important military

<sup>12</sup> This is the structural dynamic illustrated in Figure 3.1 in Chapter Three.

**Table 4.5**  
**Strike Asset Postures and Outcomes of Failed Conventional Crisis Management Cases**

Case	State(s) A	Strike Assets			Safe?	State(s) B	Strike Assets			Safe?	Outcome Favored
		B	F	M			B	F	M		
Kashmir 1947–1949	Pakistan		Pr		No	India		Pr		No	B
Korea 1950a	North Korea		Br		Yes	South Korea				—	Unfinished
Korea 1950b	PRC		Pr		No	U.S.-led UN coalition	Em	Em		Yes	Mixed
Suez 1956a	Israel, Britain, France		Em		Israel: No Britain: Yes France: Yes	Egypt	Em	Em		No	A
Sino-Indian 1962	PRC		Pr		No	India	Pr	Pr		No	A
Kashmir 1965	Pakistan	Em	Em		No	India	Em	Em		No	B
Arab-Israeli 1967	Egypt Iraq Jordan Syria	Br	Br		No	Israel		Br/Em		No	B
Bangladesh 1971	Pakistan	Em	Em		No	India	Em	Em		No	B
Yom Kippur 1973a	Egypt, Iraq, Syria	Br/Em	Br/Em		No	Israel		Br/Em		No	B
Sino-Vietnamese 1979	PRC	Pr	Pr		No	Vietnam	Pr	Pr		No	A
Falklands/Malvinas 1982a	Argentina	Pr	Pr	Pr	Yes	Britain				—	A
Falklands/Malvinas 1982b	Britain	Br	Br		Yes	Argentina	Br	Br	Em	Yes	A
Kargil 1999	Pakistan	Pr	Pr		No	India	Pr	Em	Pr	No	B
Georgia 2008	Georgia		Br		No	Russia, Abkhazia, South Ossetia	Em	Br/Em	Pr	Yes	B

NOTE: B = bombers. F = strike fighters. M = missiles. Br = brandished. Em = employed. Pr = present. — = not applicable.

and political targets in minutes. Consequently, both were highly vulnerable to surprise attack. In the 1967 case, when Israeli intelligence determined that the Arab coalition was about to launch such an attack, Israel preempted, decimating the Arab air forces on the first day of battle and setting the stage for a joint air-ground offensive that soundly defeated the coalition in six days.<sup>13</sup> Conversely, in the 1973 case, the Arab coalition managed to surprise Israel but failed to destroy enough Israeli air and ground forces to prevent Israel from fighting back. The conflict drove the Arab coalition forces to the brink of another humiliating defeat, at which point the Soviet Union threatened to intervene and Washington compelled Tel Aviv to halt. (That case is listed in Table 4.3 as “Yom Kippur 1973b.”)<sup>14</sup>

There were similar dynamics in the 1971 Bangladesh crisis, which culminated in both a preemptive strike by the Pakistani Air Force on 15 Indian airfields and an Indo-Pakistani war.<sup>15</sup> In this case, the opposing states were much larger geographically than those in the Arab-Israeli conflicts, but they still shared contiguous borders. Because the two air forces possessed aircraft of comparable ranges and payloads—both had B-57 Canberra bombers and first-generation strike fighters—it was difficult for either side to posture strike assets in a way that could impose a stabilizing deterrent threat without putting them in range of the enemy air force.

These factors can also be seen in several other cases in Table 4.5. The 1962 Sino-Indian and 1979 Sino-Vietnamese crises and, of course, the other Indo-Pakistani conflicts all occurred between states with contiguous borders and air forces that were largely symmetrical in terms of aircraft type and capability. It is notable that none of the states in these cases brandished its airpower during the crisis in an effort to deter its opponents. That could be because these states feared that they would invite preemption in brandishing strike assets that were vulnerable to

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<sup>13</sup> For a detailed account of these events, see Chaim Herzog, *The Arab-Israeli Wars: War and Peace in the Middle East*, New York: Vintage Books, 1982, pp. 143–191.

<sup>14</sup> Herzog, 1982, pp. 225–323.

<sup>15</sup> “Bangladesh: Out of War, A Nation Is Born,” *Time*, December 20, 1971; “PAF Begins War in the West: 3 December,” *Pakdef.info*, web page, undated.

surprise attack. However, in several of these cases, aircraft were not employed for strike even after the war began, suggesting that either the states involved were trying to avoid further escalation or their air forces lacked the ability to conduct effective strike operations under fire due to shortfalls in equipment, doctrine, or competence.<sup>16</sup>

Three cases on Table 4.5 do not support proposition 2: Korea, 1950b; Falklands/Malvinas, 1982b; and Georgia, 2008. In these cases, State A opponents attacked even though their State B adversaries postured potent strike assets in ways that were safe from preemption. In the first case, the United States had large numbers of bombers and strike fighters in the theater and had been employing them liberally in North Korea, yet China launched a surprise attack across the Yalu River. The presence of potent U.S. strike capabilities failed to deter China because Beijing believed that these assets would not be effective against its ground forces and the United States would probably not strike targets on Chinese territory. Although some of China's generals worried about the potency of U.S. airpower, Mao Zedong doubted that the United States could find lucrative targets in a peasant army or in unindustrialized China. He further believed that the Soviet Union's newly acquired atomic capability would extend a deterrent umbrella, discouraging U.S. air strikes against Chinese cities.<sup>17</sup>

In Falklands/Malvinas, 1982b, Britain faced a formidable deterrent threat in the Argentine Air Force, and Argentina's strike assets were safe from surprise attack by virtue of London's decision not to strike targets on the Argentine mainland.<sup>18</sup> With the disputed islands close to Argentina's coast and thousands of miles from Britain, generating sufficient combat power to fight a war would be challenging. Nevertheless, London believed that doing so was a moral and political

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<sup>16</sup> Morgan et al., 2008, pp. 188–189.

<sup>17</sup> Sergei N. Goncharov, John W. Lewis, and Xue Litai, *Uncertain Partners: Stalin, Mao and the Korean War*, Stanford, Calif.: Stanford University Press, 1993, pp. 164–166. See also Li Xiaobing, Allan R. Millett, and Bin Yu, eds. and trans., *Mao's Generals Remember Korea*, Lawrence, Kan.: University Press of Kansas, 2001, p. 63.

<sup>18</sup> James A. Haggart, *The Falkland Islands Conflict, 1982: Air Defense of the Fleet*, Quantico, Va.: Marine Corps Command and Staff College, May 1984.

imperative, so it was determined to defy the odds and retake the islands by force.<sup>19</sup> The resulting conflict was intense, and the outcome was a near-run thing. Ultimately, the war was short but costly to both sides.

The final case in Table 4.5, the 2008 war between Georgia and the Russian Federation over Georgia's breakaway provinces Abkhazia and South Ossetia, is the most difficult to reconcile with proposition 2. In the months prior to the conflict, violent incidents between Georgians and residents of the breakaway provinces grew increasingly frequent and severe. As these troubles were brewing, Russia, which was sympathetic to the breakaway provinces and had peacekeepers there, deployed forces to its neighboring North Caucasus Military District and brandished them in a military exercise near the Georgian border.<sup>20</sup> The Russian deployment included several regiments of strike aircraft. Given the limited size of the Georgian Air Force and the effectiveness of Russian air defenses, the Russian planes (and ground forces) represented a potent deterrent threat that was safe from preemption.

Unfortunately, Georgia was not deterred. On August 8, 2008, it launched an attack on South Ossetia. Russia immediately intervened there and in Abkhazia, decisively defeating the Georgians in less than two weeks.<sup>21</sup> This outcome is clearly inconsistent with proposition 2. It and the Falklands/Malvinas case should serve as reminders that states should not rely on deterrent forces alone in conventional crises. When deploying strike assets to stabilize a crisis, U.S. leaders should be mindful that military confrontations with other states could always result in war, regardless of the odds against it. Whether due to a sense of economic, political, or moral imperative, or simple miscalculation, some states will defy the odds. Wars happen.

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<sup>19</sup> For an in-depth analysis of British motivations in the war, see Daniel K. Gibran, *The Falklands War: Britain Versus the Past in the South Atlantic*, Jefferson, N.C.: McFarland, 1997, pp. 89–120.

<sup>20</sup> Svante E. Cornell, Johanna Popjanevski, and Niklas Nilsson, *Russia's War in Georgia: Causes and Implications for Georgia and the World*, Washington, D.C.: Central Asia-Caucasus Institute & Silk Road Studies Program, Johns Hopkins University, August 2008.

<sup>21</sup> Jim Nichol, *Russia-Georgia Conflict in August 2008: Context and Implications for U.S. Interests*, Washington, D.C.: Congressional Research Service, March 3, 2009, pp. 2–10.

Although assessing the influence of strike assets on war outcomes was beyond the scope of this study, to come this far without at least considering the issue would seem to beg the question. In three of the four cases in which State A opponents postured aircraft to attack from bases safe from preemption, those states were victorious, at least in the first phase of those wars (gains made in Suez, 1956a, and Falklands/Malvinas, 1982a, were reversed in Suez, 1956b, and Falklands/Malvinas, 1982b). Yet, a review of the outcomes of all of the conflicts in Table 4.5 reveals a stronger correlation between overall military strength and victory than between strike asset postures and victory. This observation, combined with insights gained from the analysis of the data in Table 4.4, suggests that while strike asset postures play an important role in deterrence and crisis stability, if those approaches fail, the war's ultimate outcome will likely be decided by whichever actor has the greatest military power writ large.

That observation is underscored by the data collected on seven cases in which the United States and its allies or coalition partners resolved crises by imposing solutions on much weaker opponents. The results of those cases are provided in Table 4.6.

In all of these cases, U.S. leaders decided to end ongoing confrontations by imposing their demands on opponents via force of arms. In the first two, Grenada, 1983, and Panama, 1989–1990, the United States did not brandish strike assets to reinforce its coercive demands. It simply invaded. Neither country had strike assets to posture in efforts to deter the U.S. attack, nor could they have likely kept such assets safe from preemption, had they existed. In fact, the only case in which a State B opponent made a credible effort to brandish strike assets to deter a U.S. attack was Iraq in 1991. There, air supremacy rendered the coalition's strike assets safe from preemption and enabled the rapid destruction of Iraqi bombers and strike fighters. Iraqi's mobile missile launchers were safe from preemption, but its unguided missiles lacked anything close to the potency that would have been needed to deter the coalition attack or affect its outcome. In subsequent cases, State A opponents either lacked strike assets or did not brandish them. The United States and its partners brandished and employed bombers,

**Table 4.6**  
**Strike Asset Postures and Outcomes of Successful Compellence Cases**

Case	State(s) A	Strike Assets			Safe?	State(s) B	Strike Assets			Safe?	Outcome Favored
		B	F	M			B	F	M		
Grenada 1983	USA		Em		Yes	Grenada				—	A
Panama 1989–1990	USA		Em		Yes	Panama				—	A
Iraq 1991	U.S.-led coalition	Br/Em	Br/Em	Br/Em	Yes	Iraq	Br	Br	Br/Em	B: No F: No M: Yes	A
Bosnia 1995	NATO		Br/Em	Br/Em	Yes	Bosnian Serbs				—	A
Iraq 1999	USA, Britain	Br/Em	Br/Em	Br/Em	Yes	Iraq		Pr	Pr	No	A
Kosovo 1999	NATO	Br/Em	Br/Em	Br/Em	Yes	Serbia		Pr		No	A
Iraq 2003	U.S.-led coalition	Br/Em	Br/Em	Br/Em	Yes	Iraq		Pr	Pr	No	A

NOTE: NATO = North Atlantic Treaty Organization. B = bombers. F = strike fighters. M = missiles. Br = brandished. Em = employed. Pr = present. — = not applicable.



fighters, and missiles in all remaining cases except Bosnia, 1995, where U.S. leaders decided that bombers would not be needed.<sup>22</sup>

### **Are States That Brandish Bombers Successful?**

The third proposition—success in crisis management and coercive diplomacy most often goes to the actor that postures bombers—is not directly supported by the case-study data. As Table 4.4 showed, State B actors that brandished bombers stabilized crises on their terms in only three cases and managed to obtain some of their interests (i.e., mixed outcomes) in one more. Alternatively, when State B actors brandished strike fighters, they obtained their interests in seven cases and achieved mixed outcomes in two more. The argument is supported somewhat more strongly in the inverse. In only 1 out of the 14 cases of failed conventional crisis management shown on Table 4.5 did a State B actor brandish bombers. State B actors brandished fighters in five cases on that table. Meanwhile, State A actors—those provoking the crises and, in many cases, openly starting the wars—brandished bombers in three cases and employed them without prior brandishing in two more. They brandished fighters in five cases and employed them in three more. State A actors ultimately achieved their objectives in only one of the cases in which they brandished or employed bombers, compared with two cases in which they brandished or employed fighters.

Yet, while the statistics do not unambiguously support an argument for bombers, the case strengthens when one considers several additional factors. First, the data set contains more fighter cases than bomber cases. Bombers are more costly than fighters, and not all states have a strategic need for bombers. Those whose potential enemies are well within the range of strike fighters need not invest in expensive capabilities for striking more distant targets.<sup>23</sup> Second, the bomber

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<sup>22</sup> Richard L. Sargent, "Aircraft Used in Deliberate Force," in Robert C. Owen, ed., *Deliberate Force: A Case Study in Effective Air Campaigning*, Maxwell AFB, Ala.: Air University Press, 2000, pp. 241–243.

<sup>23</sup> The air forces of Middle Eastern and South Asian countries are examples. Israel never invested in bombers. Egypt had IL-28s and TU-16s but lost them in the Arab-Israeli wars and did not replace them. India and Pakistan had B-57 Canberras but did not buy new bombers when they retired those assets in the 1980s.

threat and strike-fighter threat cases are not mutually exclusive. In many of the cases in which states brandished bombers, they also brandished fighters. Finally and most importantly, in virtually all the cases in which states stabilized crises by brandishing strike fighters, those assets were safe from surprise attack. In every instance in which the State A opponent had potent strike assets, they were either incapable of fighting their way through State B's air defenses or they could not reliably find the aircraft carriers from which State B threatened its attacks. Given State A limitations, State B opponents could posture strike fighters close enough to achieve potency comparable to bombers while enjoying the relative safety that would have required distant basing against more capable opponents. As a result, states have often been able to obtain the benefits of long-range strike while using short-range strike aircraft.

In this regard, the analysis of the historical cases fails to adequately inform future requirements. The United States will not enjoy the luxury of sanctuary in close basing nearly as often in the 21st century as it did in the 20th century. With growing access to space-based surveillance data and the proliferation of ballistic missile, cruise missile, and PGM technologies, future adversaries will be able to project precision strike capabilities much farther from their borders than enemies could in the past. Land- and sea-based aircraft will have to be postured farther away in future crises, driving sortie rates down and reducing the potency of strike fighters. Bombers have been valuable assets in the past, and their value will grow in the future.

## **Additional Observations and the Refinement of Theory**

Although the findings of the attribute analysis and case-study analysis are largely consistent, there is one notable difference. The attribute analysis in Chapter Three had an embedded assumption that the six attributes measured were of equal importance.<sup>24</sup> The findings from the case-study analysis do not challenge that assumption in most respects;

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<sup>24</sup> This resulted from the decision to use radar plots to graphically display the findings.

however, it clearly did in one area. Mitigating an opponent's vulnerability to surprise attack did not prove to be nearly as important to structural stability as keeping one's own strike assets safe from surprise attack.

As previously mentioned, in 14 of the 15 cases in which international crises were effectively managed and conventional war was averted (those in Table 4.4), all State B opponents postured potent strike assets in ways that were safe from surprise attack. However, the provocateurs in those cases (the State A opponents) were safe from surprise attack in only six out of 15 instances. This suggests that keeping both sides' strike assets safe is not a crucial requirement, so long as those of the state that wants to avoid war are both potent and safe. In fact, State B actors were most successful in settling crises on terms favorable to their interests when their opponents were the most vulnerable.

Using this insight from the historical data, we can refine the theoretical framework developed in Chapter Two to require only State B's strike assets to be potent and safe from preemption, then test the revised theory against the case record. If the theory is valid, then whenever both of those conditions are met—that is, whenever State B opponents' strike assets are both potent and safe from surprise attack—the crisis should stabilize. But if either is absent, the crisis would devolve to war. Table 4.7 presents the results of this predictive analysis.

As the data on this table indicate, the revised theory has a high degree predictive power. Crisis stability outcomes were correctly predicted in 26 out of 29 cases (the three faulty predictions are highlighted and were explained earlier in this chapter). This outcome has a high degree of statistical significance.<sup>25</sup>

While structural stability does not always depend on both sides being safe from surprise attack, it is still arguable that mutual safety is the *most stable condition*. This condition was present in six of the conventional cases examined, five of which were stabilized. Conversely, the data suggest that opponent vulnerability is the *most coercive*

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<sup>25</sup> Even removing the two Israeli cases from the data set (Arab-Israeli 1967 and Yom Kippur 1973a), a test of the probability of this binomial distribution occurring by chance in 27 cases yields  $t < 0.0005$ .

**Table 4.7**  
**Predictive Analysis Using the Revised Crisis Stability Theory**

Case	State(s) B Strike		Predicted Outcome	Outcome	Case	State(s) B Strike		Predicted Outcome	Outcome
	Potent?	Safe?				Potent?	Safe?		
Kashmir 1947–1949	No	No	War	War	Poplar Tree Incident 1976	Yes	Yes	Stabilized	Stabilized
Korea 1950a	No	No	War	War	Sino-Vietnamese 1979	Yes	No	War	War
Korea 1950b	Yes	Yes	Stabilized	War	Falklands/Malvinas 1982a	No	No	War	War
Taiwan Strait 1954	Yes	Yes	Stabilized	Stabilized	Falklands/Malvinas 1982b	Yes	Yes	Stabilized	War
Suez 1956a	Yes	No	War	War	Iraq 1990	Yes	Yes	Stabilized	Stabilized
Taiwan Strait 1958	Yes	Yes	Stabilized	Stabilized	Korean Nuclear 1993–1994	Yes	Yes	Stabilized	Stabilized
Sino-Indian 1962	Yes	No	War	War	Iraq 1994	Yes	No	War	War
Kashmir 1965	Yes	No	War	War	Taiwan Strait 1995–1996	Yes	Yes	Stabilized	Stabilized
Arab-Israeli 1967	Yes	No	War	War	Kargil 1999	Yes	No	War	War
<i>Pueblo</i> Incident 1968	Yes	Yes	Stabilized	Stabilized	Hainan Incident 2001	No	Yes	Stabilized	Stabilized
EC-121 Shootdown 1969	Yes	Yes	Stabilized	Stabilized	Korean Nuclear 2003	Yes	Yes	Stabilized	Stabilized
Black September 1970	Yes	Yes	Stabilized	Stabilized	Korean Missile 2006–2007	Yes	Yes	Stabilized	Stabilized
Bangladesh 1971	Yes	No	Stabilized	Stabilized	Georgia 2008	Yes	Yes	Stabilized	War
Yom Kippur 1973a	Yes	No	War	War	Yomp'yong-do 2010	Yes	Yes	Stabilized	Stabilized
Belize 1975	Yes	Yes	Stabilized	Stabilized					

*condition.* In nine of the 15 conventional crises stabilized, states were able to impose threats of surprise attack on their opponents while holding their own strike assets safe from preemption. Those states achieved favorable outcomes in six of those cases and mixed outcomes in the other three.

With that relationship in mind, when U.S. leaders find themselves in a confrontation with a relatively weak state, they might choose to bear some additional risk of war by posturing strike assets in ways that make the opponent feel more vulnerable, maximizing their coercive leverage. However, when facing a dangerous state—one with nuclear weapons or even powerful conventional forces—U.S. leaders should posture strike assets in a way that imposes a powerful deterrent threat but mitigates the threat of U.S. surprise attack. In either case, bombers exhibit the desired attributes more strongly than the other strike assets examined in this study.

## **Building a Force for Crisis Management and Structural Stability**

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This study examined the potential effects of alternative long-range strike systems on crisis stability and the utility of those systems as tools for crisis management. The findings presented here are intended to inform the U.S. Air Force's force structure decisions and offer insights to U.S. leaders for posturing strike forces during confrontations with dangerous states.

To accomplish the tasks set out in this study, RAND researchers identified six desirable attributes of strike systems that make them conducive to structural stability and usable for crisis management, and they assessed the degree to which alternative strike systems (bombers, strike fighters, ballistic missiles, and cruise missiles) exhibit those attributes. The study included a survey of 48 international crises since World War II to determine whether the historical record provides evidence to support propositions drawn from the attribute analysis. Not only was that evidence found, but the case survey also provided additional insights that enriched the initial findings. This chapter integrates those findings and draws implications from them.

### **The Strengths and Weaknesses of Alternative Strike Assets**

#### **Aircraft Are Excellent Tools of Crisis Management**

Both types of aircraft examined in this study, bombers and strike fighters, are richly endowed with the attributes needed to be effective tools of crisis management. Aircraft excel in their flexibility, responsiveness,

and ability to signal. They can cover great distances in any direction quickly, free of the obstructions of surface terrain. They can be flushed promptly and deployed to bases in distant theaters within hours. They can carry a large assortment of weapons, enabling them to create a wide variety of effects in the battlespace, both kinetic and nonkinetic. Missions can be redirected and weapons reprogrammed in flight. Aircrews can receive and act on fire and hold-fire orders almost instantly. These capabilities allow aircraft to be employed in a variety of operational profiles, making them useful across a wide range of scenarios. As a result, bombers and fighters offer crisis managers capable tools for signaling U.S. levels of concern and sending discernible messages to friends and opponents alike.

### **Ballistic Missiles Have Little to Offer for Crisis Management**

Ballistic missiles, alternatively, are poor tools of crisis management. Although very responsive—ICBMs were the most responsive of the systems evaluated in this study—ballistic missiles are very limited in their flexibility and ability to signal. Both ballistic missile systems examined were restricted in the range of scenarios in which they could be employed and the kinds of attacks and weapon effects they could create. Similarly, while flushing submarines from port or putting ICBMs on alert could signal U.S. concern during a crisis, little more could be done with these systems after that to send discernible messages to an opponent.

These findings were corroborated by the case-study analysis. In a significant number of the international crises surveyed, aircraft were brandished but missiles were not. In the cases in which missiles were brandished, it was usually in the form of raising DEFCONs to communicate nuclear threats, and bombers were usually brandished as well. Conventional missiles were rarely used to signal in international crises.

Where ballistic missiles raised the most concern in this study, however, was in the effects that arming them with conventional warheads might have on structural stability. The United States would not be as constrained in using conventional ballistic missiles in a confrontation as it would be with nuclear-armed missiles. And with no visible indications they are about to be launched, their short flight times,

and their long reach into the opponent's territory, these weapons would pose a significant threat of U.S. surprise attack. At the same time, their small numbers of warheads (compared with aircraft payloads) and lack of timely reload capabilities give conventional ballistic missiles very low potency. Consequently, conventional ICBMs and SLBMs would be ineffective weapons for deterrence. On the other hand, given their low potency and relative invulnerability to conventional surprise attack, it is not clear that they would be destabilizing. With their contribution to structural stability in question and their negligible contributions to deterrence, the only definitive conclusion that this study could draw about conventional ICBMs and SLBMs was that they offer little, if anything, to structural stability or crisis management.

### **Cruise Missiles Are Important Enablers of Other Crisis Management Tools**

In contrast to conventional ballistic missiles, the case-study analysis confirmed that cruise missiles, whether fired from aircraft or from naval vessels, have demonstrated their utility in war. Due to the relationship between warfighting ability and conventional deterrence, these weapons also have important roles to play in structural stability and crisis management. But their principal value derives little from any independent contribution to deterrence. Inventory limitations on weapons delivered from all platforms and the inability to quickly reload weapons fired from submarines drive cruise missile potencies down to levels that make them unlikely to pose significant deterrent threats by themselves; however, their ability to salvo against key targets in an opponent's IADS endows them with an important enabling capability, amplifying the potency of penetrating aircraft.

Findings of both the attribute and case-study analyses indicate that aircraft postures have a greater influence on structural stability than the postures of other strike systems. But if cruise missile delivery platforms, such as legacy bombers and SSGNs, are present—or, more accurately, if the opponent *believes* they are present—the threat of penetrating airstrikes will be even more potent. This dynamic exemplifies the proverbial “double-edged sword.” If the aircraft projecting the principal threat are postured in a way that makes them vulnerable



to preemption, the added threat of cruise missiles disabling the opponent's IADS will only increase the resultant instability. Conversely, if aircraft are postured to project a potent deterrent threat from positions safe from surprise attack, the cruise missile threat will heighten the strength of the deterrent, adding to structural stability.

### **Aircraft Are Potent Weapons of Deterrence, but Old Approaches May Destabilize Future Crises**

Bombers and strike fighters can both generate potent deterrent threats. Bombers, with their large payloads, and fighters, when based close to enemy targets, can deliver high volumes of conventional ordnance in short periods of time. Air-delivered munitions can destroy a wide range of target types and create highly diverse weapon effects, both kinetic and nonkinetic. As a result, the threat of conventional air attack is a potent deterrent that states have used frequently since World War II.

Yet, strategies employed to stabilize past crises might be destabilizing in future confrontations. In a significant number of the historical cases examined, states postured short-range strike fighters close to their opponents, either at air bases or on aircraft carriers, to generate the potency needed to deter those actors. That was acceptable in most of those cases because the state or states brandishing aircraft—the United States was usually the main actor—enjoyed the luxury of confronting adversaries that largely lacked the capabilities to strike these bases and aircraft carriers. Unfortunately, that era may soon be coming to an end.

With the proliferation of space, missile, and PGM technology, future opponents confronting the United States are likely to have large inventories of ballistic and cruise missiles able to target air bases and aircraft carriers at ever increasing ranges. Carriers, being mobile platforms, will continue to be more survivable than land bases. But in both cases, posturing short-range strike fighters close enough to pose a potent deterrent threat could make them vulnerable to enemy surprise attack. At the same time, short distances from U.S. bases and carriers to their targets would result in short warning times for the opponent's forces and compressed decision times for opposing leaders. They would be facing a substantial threat of U.S. surprise attack. This combination

of threat and vulnerability would make stabilizing a crisis exceedingly difficult and would invite preemption.

A number of options may be available for reducing the vulnerability of short-range fighters. Air bases could be dispersed or hardened. Active and passive defenses against ballistic and cruise missile attacks could be improved on land and at sea. Yet, while these prospects exist, it is increasingly clear that U.S. strike aircraft will not be able to posture as close to dangerous opponents in the future as they could when facing less capable adversaries in the past. But moving strike fighters back without compensating for the attendant dilution of deterrence could also be destabilizing. While basing fighters and posturing CSGs farther away would reduce their vulnerability and the threat of U.S. surprise attack, it would also drive down sortie rates, reducing the potency of these assets. Seeing that posture, an aggressive, risk-tolerant opponent might be tempted to attack a regional friend of the United States, doubting that U.S. strike forces could provide adequate firepower to defeat it from afar.

### **Penetrating Bombers Offer Potency Without Excessive Vulnerability**

Penetrating long-range bombers (i.e., aircraft with sufficient range and payload to operate effectively from distant bases and with sufficient passive and active defenses to survive in the opponent's defended airspace) offer one possible answer to this dilemma. Assuming the bombers would not be overly dependent on close-based support assets, they could generate a potent deterrent threat without exposing U.S. forces to an inordinate amount of vulnerability to surprise attack.<sup>1</sup> Distant basing also mitigates the threat of U.S. surprise attack. Due to their stealthy characteristics and deep reach into the opponent's defended airspace, penetrating bombers would be somewhat more threatening than strike fighters operating from the same ranges, but U.S. leaders could manage this threat by coordinating tactics within a broader crisis

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<sup>1</sup> This study assumed that sufficient support for long-range penetrating bombers could be provided from afar: distant-based assets for refueling, ISR (with reconnaissance largely from space-based assets), and suppression of enemy air defenses (contributed by standoff electronic warfare, and standoff strike from legacy bombers and SSGNs). More detailed analysis of operational requirements will be needed before force posture decisions are made.

management strategy. Substantial numbers of standoff and penetrating bombers could be deployed to regional bases to generate a deterrent threat but kept well away from the opponent's defended airspace to mitigate the threat of surprise attack. Should U.S. leaders decide that it is necessary to intensify the threat, bomber patrols could be moved closer to the opponent or increased in number and frequency. Given the flexibility and responsiveness inherent in airpower, bombers would give U.S. leaders the ability to modulate threats to send the signals needed in carefully nuanced crisis management strategies.

### **Putting the Findings into Perspective**

This study found that, considered individually, aircraft are the strike assets that offer decisionmakers the most flexible and responsive tools for crisis management, and long-range penetrating bombers are the strike assets able to contribute the most to structural stability. To conduct the analysis that led to these findings, it was necessary to compare the relevant attributes of individual classes of strike asset and examine the effects that each generated in historical cases. But this analytical approach was not meant to suggest that decisionmakers should acquire any single kind of strike asset exclusively, either for crisis management or for warfighting, or that they should posture or employ them individually to create desired effects. Moreover, this analysis does not argue that decisionmakers should procure strike assets to the exclusion of other force elements. It does, however, point out that long-range strike can bring deterrent threats to bear from afar, and more quickly, in a crisis.

Crisis management and war are about strategy. In both, decisionmakers must marshal the means at their disposal and coordinate them in ways that achieve desired objectives. Military systems and forces do not operate independently in war, nor do opponents consider their potential effects independently when deciding whether to abide by deterrent threats or defy them. Orchestrated properly, force elements work synergistically, bringing the nation's power to bear to achieve its leaders' objectives in the most effective and efficient manner possible.

Therefore, this report does not suggest that penetrating bombers should constitute the nation's sole deterrent, conventional or nuclear. Nor does it imply that other strike assets or other force elements are not needed to perform missions aside from fighting wars, deterring wars, or managing crises. Ultimately, the nation will continue to need a suite of capabilities that operate in multiple domains to ensure its security.

That said, the analysis does indicate that long-range, penetrating bombers offer a combination of attributes that are important for stabilizing international crises, and these attributes are not exhibited as robustly by other strike assets. Since the end of World War II, bombers have been important arrows in the nation's quiver of force projection capabilities. They will likely remain so in the future.



## Two Illustrative Cases of Crisis Management

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This appendix provides detailed synopses of two cases of crisis management: the 1914 July crisis and the 1962 Cuban missile crisis. The first case illustrates the complex dynamics that emerge when multiple conventionally armed states, widely disparate in size and military capability, attempt to stabilize a crisis in a highly volatile environment. The second case, conversely, highlights the dynamics in a confrontation between two very powerful opponents, each with a nuclear arsenal capable of inflicting catastrophic damage on the other. Taken together, these cases capture the wide range of structural stability and crisis management dynamics likely to be exhibited in confrontations between the United States and potential opponents in the coming decades.

### The 1914 July Crisis

The crisis that ultimately led to World War I began on June 28, 1914, when a member of a Serbian terrorist group assassinated the heir to the Austro-Hungarian throne, Archduke Franz Ferdinand, and his wife while they were visiting Sarajevo, the provincial capital of Bosnia and Herzegovina. After three weeks of investigation and internal debate, Austria-Hungary blamed Serbia for the assassination and, with Germany's encouragement, delivered an ultimatum to Belgrade on July 23 that, if accepted, would have delimited Serbian sovereignty. Belgrade attempted to satisfy most of Vienna's demands but had no alternative but to reject the most onerous terms of the ultimatum. As a safeguard, Serbia began mobilizing its military forces on the Austro-Hungarian

frontier the day it tendered its reply. Vienna, on receiving Belgrade's reply, broke diplomatic relations and mobilized its forces as well.<sup>1</sup>

### **Crisis Management While Hedging**

As tensions worsened, several European leaders attempted to stem the momentum toward war or, at least, keep it localized. British Foreign Secretary Sir Edward Grey urged Vienna to accept Serbia's reply to the ultimatum and made several attempts to mediate between the parties, including an effort to assemble a four-power conference of British, French, German, and Italian ambassadors to seek an end to the crisis. On two occasions, Russia, Serbia's traditional protector, urged Germany to counsel Austria-Hungary's restraint. Kaiser Wilhelm ultimately did so after Austro-Hungarian military operations began, and Tsar Nicholas proposed a Hague conference to defuse the crisis.<sup>2</sup> But while these efforts were under way, all the principal continental powers took initial steps to mobilize their military forces as a precaution, each alarming its neighbors and making war all the more likely.<sup>3</sup>

### **Why the Flames of War Spread So Quickly**

When war finally broke out, interlocking alliances and offensive military doctrines caused it to spread quickly.<sup>4</sup> On July 27, Austria-Hungary declared war on Serbia and bombarded Belgrade the next day. On July 29, Russia began a general mobilization to defend Serbia and its own territory in the event that Germany intervened on Austria-Hungary's behalf. In response, Berlin sent St. Petersburg a 12-hour ultimatum to stop military measures on the German frontier, and France ordered a general mobilization in support of its alliance partner,

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<sup>1</sup> Strachan, 2004, pp. 100–101.

<sup>2</sup> During the crisis, top-level negotiations were carried out through the exchange of telegrams between Kaiser Wilhelm and Tsar Nicholas, who were cousins and nominal friends. These telegrams can be reviewed in Michael S. Neiberg, ed., *The World War I Reader: Primary and Secondary Sources*, New York: New York University Press, 2007, pp. 46–49.

<sup>3</sup> Levy, 1991.

<sup>4</sup> Keegan, 2000, p. 52; Strachan, 2004, pp. 124–125.

Russia. On August 1, Germany ordered a general mobilization and declared war on Russia.<sup>5</sup>

Given that France and Russia were allies, Berlin knew that any war with Russia would be a war with France as well, and German military planning for that eventuality required defeating France before turning full attention to Russia. Therefore, on August 2, Germany invaded Luxembourg and demanded free passage through Belgium to allow the German Army to execute its longstanding operational plan, which included a turning movement to attack France from the north.<sup>6</sup> Up to this point, the British government had been divided on whether to support France against Germany and had only ordered the Royal Navy to protect the north coast of France and the English Channel against German naval attack. But the German invasion of Luxembourg and ultimatum to Belgium, with which Britain had a treaty to defend, steeled British resolve. London ordered a general mobilization and tendered an ultimatum to Berlin on August 3, the same day that Germany declared war on France.<sup>7</sup> The following day, Germany invaded Belgium and Britain declared war on Germany. Three days later, Austria-Hungary declared war on Russia, and it invaded Serbia on August 12. Europe was at war.<sup>8</sup>

### **Motives for Limited War**

Given the considerable efforts made to defuse this crisis, it may be difficult to understand why they all failed—until one considers the fact that not all of the principal actors wanted to avoid war. Some of them were sufficiently dissatisfied with the geopolitical status quo that they were willing to risk a limited war to change it.

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<sup>5</sup> Howard, 2007, p. 24; Keegan, 2000, pp. 66–70; Strachan, 2004, pp. 101–107; Samuel R. Williamson, Jr., “The Origins of World War I,” *Journal of Interdisciplinary History*, Vol. 18, No. 4, Spring 1988.

<sup>6</sup> Larry H. Addington, *The Patterns of War Since the Eighteenth Century*, 2nd ed., Bloomington, Ind.: University of Indiana Press, 1994, pp. 134–135.

<sup>7</sup> Barbara W. Tuchman, *The Guns of August*, New York: Random House, 1962, Ballantine, 1994, pp. 133–140.

<sup>8</sup> Levy, 1991, p. 92.



Austria-Hungary's standing among Europe's great powers had deteriorated over the previous decade due to ever-worsening ethnic tensions within the empire and an increasingly powerful and hostile Serbia on its border.<sup>9</sup> As Jack Levy argues, Austro-Hungarian leaders believed they would ultimately need to bring the Balkans under their dominion or risk a collapse of the monarchy. Franz Ferdinand's assassination gave them the pretext to deliver an ultimatum that, if accepted, would have achieved that objective without cost. Vienna doubted that Belgrade would accept the ultimatum—in fact, its authors deliberately wrote it in a way that made it unacceptable—but with Berlin's backing to deter Russian intervention, Vienna was willing to fight a limited war to bring Serbia to heel.<sup>10</sup>

Germany eagerly gave that backing. Long concerned about the steady erosion of its alliance partner's power, Berlin wanted Vienna to reverse that trend.<sup>11</sup> German leaders insisted that the ultimatum to Serbia be framed in terms that would make Belgrade's acceptance impossible, and they urged Austria-Hungary to attack Serbia as quickly as possible to achieve a *fait accompli* before other powers could mediate an end to the crisis or Russia could intervene on Serbia's behalf.<sup>12</sup> Should the latter occur, Germany would have been obliged to support Austria-Hungary in a war that would also pull in Russia's primary alliance partner, France. But Berlin saw that risk as manageable and perhaps even desirable. Given Russia's vast territory and underdeveloped transportation system, German military planners believed they could defeat France before St. Petersburg could fully mobilize its army. Then, Germany could shift its full military capabilities east to defeat Russia, thereby achieving a major realignment in the European balance of power.<sup>13</sup>

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<sup>9</sup> Strachan, 2004, pp. 45–80.

<sup>10</sup> Levy, 1991, pp. 90–92.

<sup>11</sup> Howard, 2007, p. 21.

<sup>12</sup> Lebow, 1984a, p. 120; Strachan, 2004, pp. 90–91.

<sup>13</sup> Addington, 1994, p. 106; Keegan, 2000, pp. 42–43; Levy, 1991, pp. 68–70; Annika MomBaur, "A Reluctant Military Leader? Helmuth von Molke and the July Crisis of 1914,"

Berlin's major concern, however, was whether Britain would enter the war on France and Russia's side. Early in the crisis, it appeared that political indecision in London would forestall that threat. Therefore, on July 5, Kaiser Wilhelm assured the Austrian ambassador that Austria-Hungary could count on Germany's full support even in the case of Russian intervention. As the crisis intensified, however, and British intervention appeared more likely, the Kaiser began to get cold feet. On July 28, he directed Foreign Minister Gottlieb von Jagow to request that Vienna forego the war against Serbia and accept instead the temporary occupation of Belgrade as a guarantee that the Serbs would carry out the promises made in their conciliatory reply to the ultimatum. Unfortunately, this message was muddled in diplomatic language and was further confused by the timing of a message sent the same day from Chief of the German General Staff Helmuth von Moltke to his Austrian counterpart, Count Francis Conrad von Hötzendorf, urging him to begin offensive operations without delay.<sup>14</sup> As it turned out, the Russian mobilization that began on July 29 forced the issue in both Austria-Hungary and Germany.<sup>15</sup>

Russia and its Triple Entente partners, France and Britain, hoped to avoid war, but each was willing to fight under certain conditions. Ultimately, all of those conditions were met. Russian leaders, genuinely shocked by the assassination of Franz Ferdinand, believed that some amount of Serbian concessions were appropriate and would be necessary to avoid war. However, they were also sensitive to Russia's damaged reputation as a great power following its defeat in the Russo-Japanese War of 1904–1905 and humiliation in the Bosnian crisis of 1908–1909.<sup>16</sup> They believed that Russia's great power status largely

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*War in History*, Vol. 6, No. 4, 1999, pp. 421–426; Strachan, 2004, pp. 78–79, 91–92; Williamson, 1988, pp. 807–808.

<sup>14</sup> Historians often refer to him as “Moltke the Younger.” He was the nephew of a previous general staff chief by the same name, whom historians reference as “Moltke the Elder.”

<sup>15</sup> Lebow, 1984a, pp. 140–141; Levy, 1991, pp. 80–82; Strachan, 2004, pp. 109–110.

<sup>16</sup> The Bosnian crisis erupted when Austria-Hungary announced the annexation of Bosnia and Herzegovina in violation of the 1878 Treaty of Berlin and over the objections of Britain, France, Italy, the Ottoman Empire, and, especially, Russia and Serbia. The crisis was defused

depended on its influence among the southern Slavs and its patronage of Serbia. St. Petersburg could not allow Austria-Hungary to crush Serbia, nor could it accept sanctions against Belgrade that would have moved it into Vienna's sphere of influence.<sup>17</sup>

France had no direct interests in the Balkans and hoped war could be averted or, at least, contained there. However, the alliance with Russia had to be honored because it was a cornerstone of France's defense strategy against Germany. Were Germany to declare war on France, Russia would be expected to declare war on Germany, forcing Berlin to divide its forces between two fronts. But that safeguard was obtained at the cost of a reciprocal obligation: If Germany declared war on Russia, France would have to come to Russia's aid.<sup>18</sup> Moreover, France too had scars on its ego and reputation, having been defeated in the Franco-Prussian War of 1870–1871 and forced to cede the provinces of Alsace and Lorraine to Germany. Should war come, French leaders were determined to defeat Germany, retake those territories, and restore French honor. They believed France could do so with the help of its alliance partner, Russia, and Entente partner, Britain.<sup>19</sup>

Britain was the major European power that was least interested in war. Nearly all quarters in the British government preferred a settlement, based on limited Serbian concessions, to a war that might pull in members of the Entente.<sup>20</sup> Foreign Secretary Grey made repeated attempts to mediate between the parties, individually and collectively. However, in the event that a general continental war did occur, Grey, First Lord of the Admiralty Winston Churchill, and other hardliners in London believed that it would be necessary to support France and Russia against Germany to maintain the balance of power in Europe. To their frustration, that position was strongly opposed by other Brit-

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when the treaty was amended through a series of individual consultations between the states involved, with the Ottomans and the Western states accepting compromises that undercut Russia and Serbia's position.

<sup>17</sup> Lebow, 1984a, pp. 121–123; Levy, 1991, p. 67; Strachan, 2004, p. 104.

<sup>18</sup> Addington, 1994, p. 105; Howard, 2007, p. 11; Keegan, 2000, p. 52.

<sup>19</sup> Levy, 1991, p. 68; Strachan, 2004, pp. 35–36, 114–116; Tuchman, 1994, pp. 34–37.

<sup>20</sup> Keegan, 2000, p. 69; Levy, 1991, pp. 67–68; Strachan, 2004, pp. 116–117.

ish leaders. A coalition of Idealists in Parliament and the Cabinet preferred neutrality, so the British government was stalled on the issue until Germany violated Belgian neutrality in defiance of Britain's commitment to defend Antwerp's sovereignty. That event broke the political logjam in London, bringing Britain into the war.<sup>21</sup>

So, the failure of crisis management in 1914 resulted, in part, from the fact that some of the parties were willing to risk war to change the status quo. Europe's rigid structure of interlocking alliances complicated matters further, explaining why the crisis and subsequent war engulfed so many states. Yet, neither of these factors fully accounts for the breakdown, nor do they explain why the conflagration accelerated so quickly or burned so intensely once the flames of war ignited. To understand these dynamics, we must consider the military structural conditions in Europe during the crisis—conditions that developed over four decades and had their roots in lessons taken from the Franco-Prussian War.

### **The Franco-Prussian War and the Cult of the Offensive**

In the Franco-Prussian War, a confederation of German principalities led by Prussia handily defeated France, then considered the most powerful state on the European continent, largely because of preparations made by a highly professional Prussian general staff directed by Helmuth von Moltke.<sup>22</sup> Over the course of his long military career, Moltke had observed the dramatic advances in technology wrought by the industrialization of Europe. He set about to employ those developments to enhance Prussia's military effectiveness when he became chief of the Prussian general staff in 1857. Moltke and his staff capitalized on advances in telegraph communications and the growing capacity of Germany's railroad network to rapidly mobilize Prussia's "nation-in-arms," a three-tiered pool of well-trained active, reserve, and militia forces.<sup>23</sup> By developing a series of sophisticated mobilization and

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<sup>21</sup> Howard, 2007, p. 24; Lebow, 1984a, pp. 130–134; Strachan, 2004, pp. 117–121; Tuchman, 1994, pp. 100–116, 133–153; Williamson, 1988, p. 816.

<sup>22</sup> This was Moltke the Elder, the uncle of the German general staff chief mentioned earlier.

<sup>23</sup> Addington, 1994, pp. 50–54; Keegan, 2000, p. 26.

transportation schedules, the general staff could mobilize Prussia's army and deploy it to the frontiers in battle formation faster than any of its potential adversaries. Building on that advantage, Moltke's general staff developed operational plans that emphasized rapid offensive maneuver to envelop enemy formations and tactics that exploited the firepower advantages afforded by technical advances in breech-loading rifles and artillery.<sup>24</sup>

The Germans employed these developments to maximum effect in August and September 1870. After laying siege to the French fortress at Metz, they intercepted an army sent to lift the siege at Sedan, quickly enveloping it and inflicting heavy losses each time the French tried to break out of the encirclement. After only a day of fighting, the French army at Sedan surrendered, and its survivors, including Emperor Napoleon III, were taken prisoner. Later, after securing the surrender of Metz on October 31, the Germans defeated two newly raised French armies then laid siege to Paris, forcing its surrender in January 1871.<sup>25</sup>

The dramatic effectiveness that Germany achieved as a result of Moltke's innovations made a strong impression on military and political leaders across Europe, and they scrambled to enact comparable reforms in their own military institutions. In the years that followed, most adopted tiered, nation-in-arms-like military establishments fashioned on the Prussian model, enabling them to mobilize large armies of well-trained soldiers on short notice, and all developed highly synchronized deployment schedules for rushing those forces to the field. Impressed by the operational excellence Germany exhibited in 1870, other countries developed emulative doctrines emphasizing rapid offensive maneuver. In the ensuing years, offensive operations came to be vaunted as the superior form of warfare, especially in France, where faith in the ability of *élan* (spirit) and *offensive à outrance* (offensive in

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<sup>24</sup> Gunther E. Rothenberg, "Moltke, Schlieffen, and the Doctrine of Strategic Envelopment," in Peter Paret, ed., *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Princeton, N.J.: Princeton University Press, 1986.

<sup>25</sup> Addington, 1994, pp. 99–100; Rothenberg, 1986, pp. 303–305.

excess) to overcome superior numbers and firepower grew with cult-like fervor.<sup>26</sup>

### **The Schlieffen Plan and Mass Mobilization**

Meanwhile, the German general staff became almost as obsessed with the doctrine of strategic envelopment and its commitment to meticulous operational planning. A product of those obsessions was a plan developed under the direction of Count Alfred von Schlieffen, chief of the general staff from 1891 to 1906, that emphasized a turning maneuver through Belgium to outflank and envelop France's armies and force Paris's rapid capitulation.<sup>27</sup> It was rigid adherence to a version of this plan in 1914 that led Germany to value military expediency over national strategic interest when it violated Belgian neutrality, thereby bringing Britain into the war.<sup>28</sup>

The catastrophe of 1914 cannot be laid at the feet of the Schlieffen plan alone; all of the foregoing developments contributed to the structural instability that made Europe the tinderbox it had become. Faith in the primacy of the offensive encouraged states hoping to change the status quo to act out their aggressive ambitions in the belief that seizing the initiative would yield the desired reward at affordable costs. Conversely, states hoping to preserve the status quo also felt pressure to attack, believing that defensive operations would be inadequate and that their only reliable means of self-protection in the face of an imminent threat would be preemption. Meanwhile, complex, rapid mobilization schedules became a force unto themselves. As tensions rose, states began initiating partial mobilizations for their own protection (Each feared that being as little as one to three days behind an opponent's mobilization could result in defeat.)<sup>29</sup> Yet, the threat of attack

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<sup>26</sup> Michael Howard, "Men Against Fire: The Doctrine of the Offensive in 1914," in Peter Paret, ed., *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Princeton, N.J.: Princeton University Press, 1986; Van Evera, 1984; Williamson, 1988.

<sup>27</sup> Addington, 1994, pp. 106–110; Keegan, 2000, pp. 29–36; Rothenberg, 1986, pp. 306–325.

<sup>28</sup> Keegan, 2000, pp. 42–45.

<sup>29</sup> Van Evera, 1984, pp. 72–75; Williamson, 1988, p. 801.

that such actions implied to their neighbors resulted in chain reactions of mobilization and forward movement, building an inexorable momentum toward war. The sheer complexity of these schemes made them all but impossible to alter or stop without leaving one's state dangerously exposed, or so European leaders believed. On August 1, when Kaiser Wilhelm became frightened that threats against Belgium might indeed bring Britain into the war, he directed Moltke to stop the mobilization in the west and, instead, shift those forces east to face Russia. In disbelief, Moltke said,

Your Majesty, it cannot be done. The deployment of millions cannot be improvised. If Your Majesty insists on leading the whole army to the East it will not be an army ready for battle but a disorganized mob of armed men with no arrangements for supply. Those arrangements took a whole year of intricate labor to complete, and once settled, it [sic] cannot be altered.<sup>30</sup>

Thus, efforts to manage the July crisis were so thoroughly undermined by the degree of Europe's structural instability that war was not averted even when one of its principal instigators lost heart at the 11th hour and tried to stop it. These observations have significant implications for efforts to manage future international crises.

## The 1962 Cuban Missile Crisis

The Cuban missile crisis began on October 15, 1962, when analysis of U-2 reconnaissance photographs revealed that, contrary to Moscow's previous assurances, the Soviet Union was building medium- and intermediate-range ballistic missile bases in Cuba.<sup>31</sup> In the days that followed, President John F. Kennedy assembled a committee of senior advisers, which he called the Executive Committee of the National Security Council (ExCom), and considered a range of options for dealing with the mounting threat. ExCom members were divided over how

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<sup>30</sup> Tuchman, 1994, p. 94.

<sup>31</sup> PFIAB, 2002.

strong a U.S. reaction was needed, with some favoring diplomacy and others arguing for military options ranging from selective air strikes to full-scale invasion. Given the risks of nuclear war and the concern that any action against Cuba might result in a Soviet countermove against West Berlin, President Kennedy and his advisers ultimately decided to impose a naval blockade—which they described as a “quarantine” to avoid the appearance of committing an act of war—in an effort to stop the shipment of additional missiles and compel Moscow to remove those already on the island.<sup>32</sup>

### The Game Begins

Over the next week and a half, U.S. leaders confronted their Soviet counterparts publically and privately. President Kennedy exchanged several letters with Soviet Premier Nikita Khrushchev, each warning the other that his actions might lead to nuclear war, as they played out a tense game of brinkmanship. On October 22, U.S. forces were put on DEFCON 3 worldwide, and the Strategic Air Command put its nuclear bomber force on alert, ensuring that a portion of the force was airborne at all times.<sup>33</sup> Moscow responded by putting the armed forces of the Warsaw Pact on alert and canceling the leaves of members of the Strategic Rocket Forces. The U.S. Navy put the quarantine in place on October 24 and began aggressive anti-submarine warfare operations against two Soviet submarines in the Caribbean and three others headed there from the Atlantic.<sup>34</sup> The Navy stopped and inspected a Lebanese-registered ship on October 25, but a Soviet freighter refused to stop and was allowed to proceed that same day. This prompted President Kennedy to issue a security action memorandum to the Supreme

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<sup>32</sup> Allison and Zelikow, 1999, pp. 111–120; Laurence Chang and Peter Kornbluh, eds., *The Cuban Missile Crisis, 1962: A National Security Archive Documents Reader*, New York: The New Press, 1998, pp. 358–365.

<sup>33</sup> Chang and Kornbluh, 1998, p. 365.

<sup>34</sup> George, 1991b, pp. 244–247. These operations were aimed at locating, tracking, and forcing Soviet submarines to surface, as opposed to engaging them in combat. See William Burr and Thomas S. Blanton, eds., “The Submarines of October: U.S. and Soviet Naval Encounters During the Cuban Missile Crisis,” *National Security Archive Electronic Briefing Book*, No. 75, October 31, 2002.



Allied Commander Europe authorizing U.S. forces to load nuclear weapons onto aircraft under their command. Immediately afterward, Moscow ordered 14 ships headed for Cuba to turn back.<sup>35</sup>

Yet, despite the apparent success of the quarantine, the confrontation appeared to have reached a stalemate, with no additional missiles reaching Cuba but none being removed. Meanwhile, the Soviets accelerated construction on the missile sites in an effort to rush the missiles already there to operational status.<sup>36</sup>

### **Kennedy Applies Pressure**

On October 26, in an effort to break the stalemate, President Kennedy decided that it was time to apply a “gradual increase in pressure” by ordering more low-level reconnaissance flights over Cuba.<sup>37</sup> This increase in air activity over Cuba followed an unauthorized comment made during an October 22 State Department press conference that the United States would be justified in taking further action, suggesting to Cuban Premier Fidel Castro that a U.S. military attack on Cuba was imminent.<sup>38</sup>

The increase in pressure appeared to have the desired effect. On the afternoon of October 26, Aleksandr Fomin, a KGB official in the Soviet Embassy, set up a private meeting with U.S. journalist John Scali and asked him to relay to the State Department that his government would be willing to withdraw the missiles in return for a U.S. commitment not to invade Cuba. This was followed by a long, emotional letter from Khrushchev to President Kennedy bemoaning the risks of nuclear war and containing a similar proposal.<sup>39</sup> In response, the State Department sent a message to Castro via the Brazilian government that the United States “might not invade” Cuba if the missiles

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<sup>35</sup> Chang and Kornbluh, 1998, pp. 369–370.

<sup>36</sup> Central Intelligence Agency, “The Crisis USSR/Cuba: Information as of 0600,” memorandum to the Executive Committee of the National Security Council, October 27, 1962.

<sup>37</sup> George, 1991b, p. 248.

<sup>38</sup> George, 1991b, p. 248; Fidel Castro letter to Nikita Khrushchev, October 26, 1962.

<sup>39</sup> It later turned out that Fomin’s approach had not been authorized by Moscow. See Allison and Zelikow, 1999, p. 350, and Chang and Kornbluh, 1998, pp. 373–374.

were removed. Late that evening, Attorney General Robert Kennedy met secretly with Soviet Ambassador Anatoly Dobrynin, and they tentatively agreed that a U.S. withdrawal of Jupiter missiles from Turkey might also be part of the settlement.<sup>40</sup>

### **Stumbling at the Brink**

Yet, even as the crisis appeared to be moving toward resolution, mishaps threatened the fragile stability that was emerging. Khrushchev, reflecting on the fact that the United States had only sporadically enforced the blockade and had not yet taken military action against Cuba, came to suspect that Kennedy was bluffing. He decided to up the ante.<sup>41</sup> On the morning of October 27, a Radio Moscow broadcast delivered another letter from the Premier to President Kennedy, this time stridently demanding that Jupiter missiles be removed from Turkey.<sup>42</sup> That day, a U-2 flying a routine air-sampling mission over the Bering Strait strayed into Soviet airspace. Soviet fighters gave chase and U.S. fighters scrambled from Alaska to defend the reconnaissance aircraft. The U-2 escaped, and all fighters returned to their bases without further incident.<sup>43</sup> Aircraft flying reconnaissance over Cuba were not so lucky. One conducting a low-level mission was damaged by Cuban anti-aircraft fire but managed to return to base. However, a U-2 was destroyed by a Soviet SAM, and its pilot was killed.<sup>44</sup> Meanwhile, the U.S. Navy reported that a single Soviet ship outside the quarantine had detached itself from the others and appeared to be headed for the blockade line.

These alarming events, following so closely after the encouraging developments of the previous day, sparked renewed debate among ExCom members about Moscow's true intentions. This change in tone

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<sup>40</sup> Chang and Kornbluh, 1998, p. 374.

<sup>41</sup> Allison and Zelikow, 1999, p. 351.

<sup>42</sup> Chang and Kornbluh, 1998, pp. 375–376.

<sup>43</sup> According to Chang and Kornbluh (1998, p. 376), Alaskan Air Command records suggest that the U.S. fighters might have been armed with nuclear air-to-air missiles.

<sup>44</sup> Chang and Kornbluh, 1998, pp. 376–377.

and added demands in the second letter, sent so publically and following the Premier's secret letter just the day before, raised questions of whether Khrushchev even remained in charge. Some members of the committee urged Kennedy to order a retaliatory air strike against one of the SAM sites in Cuba, but the President, fearing that such a move would trigger uncontrollable escalation, declined to do so.<sup>45</sup> Nevertheless, everyone present sensed that pressure for action was mounting, and it might be irresistible should another mishap occur. The crisis would have to be resolved quickly if war was to be averted.

### **The Two-Track Strategy**

In an effort to bring the crisis to a swift resolution, Kennedy devised a two-track strategy: Apply additional pressure on Moscow via an ultimatum while secretly offering concessions for a settlement. As a backdrop to the strategy, Kennedy, following a suggestion from his closest advisers, wrote Khrushchev a letter accepting the *quid pro quo* proposed in the Premier's October 26 letter—a Soviet withdrawal of the missiles in return for a U.S. public pledge not to invade Cuba—while ignoring the Premier's October 27 letter, which had added the demand of a withdrawal of Jupiter missiles from Turkey.<sup>46</sup> Fortifying this official reply with a back-channel ultimatum, the President and his advisers had John Scali meet again privately with Aleksandr Fomin and angrily threaten the Soviet official that “if the missiles were not removed within hours, a U.S. attack would be mounted.”<sup>47</sup> This threat was allegedly reinforced that evening in another secret meeting between Robert Kennedy and Ambassador Dobrynin, but there, Kennedy added the second element of the strategy: a pledge to remove the Jupiter missiles from Turkey within six months of the end of the crisis, on the condition that the commitment remain secret.<sup>48</sup>

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<sup>45</sup> Allison and Zelikow, 1999, pp. 353–354; Chang and Kornbluh, 1998, p. 377; George, 1991b, p. 251.

<sup>46</sup> Chang and Kornbluh, 1998, p. 377.

<sup>47</sup> George, 1991b, p. 252.

<sup>48</sup> Allison and Zelikow, 1999, p. 360; Chang and Kornbluh, 1998, p. 378.

### The Resolution

Khrushchev accepted this formulation. Moscow, too, had sensed that the two nations were hovering at the brink of war and that a settlement had to be reached soon or events might spin out of either side's control. Although Dobrynin later denied that Robert Kennedy had given him an ultimatum in the October 27 meeting, he did concede that, based on intelligence available to him on U.S. military preparations, he believed that an air strike or even an invasion was "very likely in the coming days."<sup>49</sup> On October 28, President Kennedy and Premier Khrushchev, working through UN Secretary-General U Thant, formalized an agreement that Moscow would remove the missiles and dismantle the bases in return for a U.S. public commitment never to invade Cuba. In the months that followed, both sides carried out their respective public and private commitments and tensions eased.

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<sup>49</sup> George, 1991b, p. 252.



## Analyzing the Attributes of Alternative Strike Systems

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This appendix explains the methods used in the attribute analysis described in Chapter Three and provides details on the scoring of each strike system's attributes. Chapter Two identified three attributes desirable in strike systems to make them most conducive to structural stability and three additional attributes that increase their utility as tools for crisis management. What follows is the method the study developed and employed to measure and compare these attributes in alternative strike systems. This appendix also provides completed scoring tables with elaborating explanations for each of the strike systems evaluated: strike fighters (F-35s); legacy bombers (B-52s and B-1s) with standoff weapons; future penetrating bombers (B-Xs); and conventionally armed ICBMs, SLBMs, and SLCMs.

### The Method

#### Overview

This analysis was conducted by a team composed of two primary researchers working in the RAND Project AIR FORCE (PAF) Strategy and Doctrine Program and supported by seven other subject-matter experts from several other RAND research programs. Subject-matter experts assisted the principal team members in both the design of the scoring templates and the scoring of the strike assets. Specialists working in the PAF Force Modernization and Employment Program were consulted when scoring U.S. Air Force air and missile strike systems. Navy specialists working in the RAND National

Security Research Division advised the team on submarine and carrier operations and assisted with template design and scoring for the Navy strike systems. Scores were first assigned by the primary researchers based on the methods and criteria described later in this appendix. These scores were then adjusted as needed until consensus was reached with relevant subject-matter experts.

At several points during the process, the principal investigator consulted subject-matter experts at Headquarters U.S. Air Force on template design and strike asset scoring. These sessions included meetings with individual staff members from the Directorate of Operational Capability Requirements, the Chief's Strategic Studies Group, and with the Special Assistant to the Air Force Chief of Staff. In addition to briefing the sponsor at several points in the study, the principal investigator briefed the Chief's Strategic Studies Group and the Air Force Strategy Forum. These meetings and briefings generated a good deal of constructive discussion and, occasionally, recommendations regarding template design and strike asset scoring, some of which resulted in minor adjustments. However, no changes were made without the consensus of RAND subject-matter experts.

The study team began the analysis by disaggregating each of the six attributes identified in Chapter Two into its constituent parts. The components were then weighted in terms of their relative contribution to each attribute. This process created an empty table that served as a standard template for scoring alternative strike systems. The team then scored each asset by evaluating system parameters and filling in its respective table. The principal team members consulted with subject-matter experts repeatedly throughout the component identification, weighting, and scoring process. Finally, the data from the completed tables were used to generate radar plots for graphical comparison.

### **Dealing with the Challenges**

Finding objective ways to measure the attributes of alternative strike assets raised interesting challenges. Potency was a particularly thorny issue. Large platforms, such as bombers and guided-missile submarines, can carry heavy payloads long distances, but fighters might be available in much greater numbers. Postured forward, they could gen-

erate high sortie rates and put a significant amount of ordnance on a high number of targets over time. The team also had to consider the kinds of weapons each platform can deliver and the range of profiles in which it might be employed. Similar issues arose regarding other attributes. Preemption vulnerabilities, for instance, are scenario-dependent. Ultimately, the team concluded that a scenario-based approach would yield richer, more reliable information than a simple platform-to-platform comparison across attributes.

### **Assumptions for Scoring**

Since the analysis was designed to support Air Force decisionmaking about future force structure, the team developed a notional scenario in the 2025–2030 time frame in which the United States would need to stabilize a crisis with a dangerous state opponent. Such a confrontation might occur in a range of potential locations, such as Europe, Southwest Asia, South Asia, Southeast Asia, or East Asia. The opponent would be one or a combination of several types of states. Possibilities might include a great power with robust nuclear and conventional capabilities, a regional power with a small- to medium-sized nuclear arsenal and niche-area conventional capabilities, or a conventionally armed regional power with security guarantees by a more powerful nuclear-armed state. The crisis would begin with a low-level confrontation, but it would intensify, prompting the United States to posture strike forces at regional bases and in surrounding waters.

If facing a great power, the opponent was assumed to have a sizable nuclear force with secure second-strike capabilities. The opponent would have a competent, fourth-generation air force with force-projection capabilities and some fifth-generation aircraft. Its home territory would be protected by a dense, sophisticated IADS with S-400 SAMs and some S-500 SAMs. It would have a large force of conventional SRBMs, MRBMs, IRBMs, and ASBMs, all capable of delivering PGMs. Its anti-submarine warfare capabilities would be comparable to those of the United States in 2010 when operating in its own coastal waters, and it would have some broad-ocean capability as well.



Regional opponents were assumed to have some number of nuclear weapons and delivery capabilities—the precise number would not be known to U.S. leaders—that may or may not be vulnerable to preemption. The team assumed that U.S. leaders would likely be risk-averse regarding preemption prospects, but opponent leaders might not believe that. The team assumed that regional opponents would also have some conventional capabilities comparable to those of great power opponents, but only in niche areas (mainly advanced IADS and missiles).

Assumptions regarding U.S. force availability and posturing in the 2025–2030 era were based on open-source descriptions of Air Force and Navy future strike system concepts and future Air Force deployment and force structure data collected for a parallel study on the cost-capability trade-offs of alternative long-range strike systems then being conducted in RAND’s Force Modernization and Employment Program.

The scenario assumed that the United States would have some air and naval assets in place at the onset of the confrontation and would forward deploy additional forces to the region as the crisis intensified. Air assets would have the option of deploying to *close bases*, defined as close enough to the opponent for each aircraft to generate up to three combat sorties per day, or to *distant bases*, from which each plane could generate only one sortie per day.

For potency calculations, the study team postulated that opponent leaders would assume that, if the crisis devolved to war, they could hold out for up to 30 days. Therefore, to successfully deter such a conflict, U.S. forces would need to posture a strike force that could, if necessary, conduct 30 days of robust warfighting operations. The team used the 30-day benchmark to calculate the aggregate weight of ordnance that each platform could deliver during such a conflict, based on the number of sorties available from forces in theater at the beginning of the crisis, plus those deployed over its duration. This generated a gross weight for each platform type, which the team compared to determine proportionate “mass multiples” to multiply against available points in each of the other potency subcategories (range, persistent threat, penetrate defenses, persistent attack, and hard-target kill). A mass multiple of 1.000 was assigned to the system capable of deliver-

ing the greatest aggregate weight of ordnance over the 30-day scenario, and mass multiples calculated for other systems were based on how their aggregate ordnance delivery capabilities compared during the same length of time.<sup>1</sup>

For instance, if Strike System A could deliver the greatest aggregate weight of ordnance in 30 days and that weight is 1 million kg, and Strike System B could deliver 400,000 kg during the same period, then Strike System A received a potency multiple of 1.000 and Strike System B received a potency multiple of 0.400. Strike System A's total potency score would then be 1.000 times the total number of points awarded in the potency subcategories (a total of 25.000 points possible), and Strike System B's would be 0.400 times the total number of points it received in the potency subcategories (resulting in a total of 10.000 points possible).

The team scored all other attributes for each strike system by simply adding the points awarded in attribute subcategories.

### **Disaggregation of Structural Stability Attributes**

The three structural stability attributes were disaggregated into subcategories as follows.

#### **Potency**

Each strike asset's potency was evaluated in terms of the following factors:

- the mass of ordnance it can deliver on target over time, a function of payload and sortie rate<sup>2</sup>
- its range in terms of how far its weapons can reach into contested airspace
- the persistence with which it can threaten targets, a function of sortie rate and loiter time
- the persistence with which it can press an attack, a function of sortie rate, weapons load, rate of expenditure, and loiter time

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<sup>1</sup> The potential effects of platform attrition over the 30-day scenario were not factored into the calculation of the aggregate weight of ordnance or mass multiples.

<sup>2</sup> This figure was used to generate the mass multiple.

- its ability to penetrate defenses, a function of speed, stealth, and countermeasures
- the hard-target kill capabilities of the weapons it can deliver, a function of weapon size, precision, and design.

***Ability to Minimize U.S. Vulnerability to Surprise Attack***

How vulnerable each strike asset is to surprise attack was calculated on these criteria:

- its vulnerability on the base or in the port from which it sorties for employment as a function of
  - how much time it must spend on base or in port and how quickly it can be flushed
  - the range of the employment bases or ports from the launch points of the opponent's strike assets
  - availability and capabilities of hardening, sheltering, and other passive defenses
  - availability and capabilities of early warning and active defenses
- its vulnerability to sudden attack while on patrol as a function of
  - range from enemy defenses
  - the enemy's defensive capabilities (e.g., range, speed, lethality)
  - how easily the platform can be detected and engaged
  - warning time and defensive countermeasures.

***Ability to Mitigate Threat of U.S. Surprise Attack***

The degree to which each strike system can mitigate the threat of U.S. surprise attack while imposing a deterrent threat on the opponent was evaluated according to the following criteria:

- the degree to which changes in alert status are visible to the opponent, a function of how the asset is based and postured
- the degree to which the platform or weapon is visible in deployment, on patrol, and in employment, a function of
  - capabilities of the opponent's early warning systems
  - stealth of the platform or weapon.

- the asset's potential for prompt, potent attack, a function of the number, mass, range, and precision of weapons that can be delivered in a short time<sup>3</sup>
- the amount of time opponent leaders are likely to perceive they have from detection of attack to risk of destruction, a function of
  - speed of the attack
  - capability of the opponent's early warning systems
  - capability of the opponent's defenses.

### **Disaggregation of Crisis Management Attributes**

The three crisis management attributes were disaggregated as follows.

#### ***Flexibility***

How flexible a strike asset is for use in crisis management was evaluated according to the following criteria:

- the range of scenarios in which the asset can provide utility, e.g.,
  - show of force
  - punitive raid
  - limited engagement
  - sustained, limited war
  - major conventional operation
  - nuclear strike
  - nuclear war
- flexibility of employment profiles, including
  - the range of tactical profiles in which the asset can be employed
  - whether the asset can be employed in ways that clearly distinguish conventional strikes from nuclear strikes
- the variety of weapons effects it can create, such as
  - nonkinetic and kinetic effects
  - soft-target destruction
    - point targets
    - broad-area targets
    - area denial

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<sup>3</sup> Note that this subcategory required inverse scoring: The greater the threat of prompt potency, the lower the score in terms of mitigating the threat of U.S. surprise attack.

- hard-target destruction
  - sheltered
  - buried
- nuclear effects.

### ***Responsiveness***

How responsive each strike asset is was evaluated in terms of how quickly

- it can be deployed from home base or port to the base or port of employment, or employed from home directly in the region of conflict
- a platform can be flushed or weapons can be launched from base
- weapon loads can be changed
- weapons can be reprogrammed during deployment and employment
- a platform can be redirected or withdrawn while being deployed or employed
- an order to fire or hold fire can be received and acted upon
- weapons can be put on target from time of
  - deployment order (submarines and aircraft)
  - launch order (ICBMs, submarines, and aircraft on patrol)
  - scramble from port or base (submarines and aircraft).

### ***Ability to Signal***

A strike asset's utility for signaling was evaluated in terms of whether

- it can be postured in ways that visibly indicate different levels of U.S. concern
- it can be deployed or postured to threaten the adversary in ways that are measured and distinguishable, including whether
  - conventional threats can be clearly distinguished from nuclear threats
  - operations can be visibly modulated in tempo and intensity in support of diplomacy

- deployment, posturing, or employment can be changed in ways that signal restraint or willingness to negotiate
- it can be deployed or postured to threaten the adversary in ways that are credible.

### Generating the Scoring Template

With structural stability and crisis management attributes disaggregated, the team gave each attribute 25 possible points, distributed among subcategories according to their importance as determined in consultation with subject-matter experts. Arranging the attributes with weighted subcategories in a table produced the scoring template shown in Table B.1.

### Scores of Alternative Strike Systems

After developing the scenarios and the scoring template, the team set about scoring the alternative strike systems. Some of the attribute components—for example, the variety of possible weapons loads as a measure of a strike asset's *flexibility*—could be (and were) scored apart from the scenario, simply by reviewing technical data. However, scenario-based analyses were essential for assessing the structural stability attributes (potency, ability to minimize U.S. vulnerability to surprise attack, and ability to mitigate threat of U.S. surprise attack), because these factors are highly dependent on the number of forces available and where they are postured vis-à-vis enemy targets and weapon systems. To maximize potency across the force, F-35s and B-Xs were employed to penetrate enemy air defenses and deliver precision-guided glide weapons, thereby leaving the limited inventory of air-delivered cruise missiles available for legacy bombers to dispense in standoff mode. No formal war games or exercises were conducted. Rather, the team worked through the scenario as a collaborative map exercise in multiple iterations to measure the effects of alternative system postures. The scores of the strike systems follow.

**Table B.1**  
**Template for Scoring Strike Assets**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass (multiple of up to 1.000)	On base/in port: Range from threat (0–6)	Alert visibility (0–5)	Range of scenarios (0–10)	Deployment (0–3)	Level of concern (0–9)
Range (0–5)	Time on base/in port (0–3)			Flush (0–3)	
Persistent threat (0–5)	Flush time (0–3)	Deployment/ employment visibility (0–5)	Range of profiles (0–10)	Load change (0–3)	Threat potency/ credibility (0–9)
Penetrate defenses (0–5)	Passive defenses (0–2)			Weapon reprogramming (0–4)	
Persistent attack (0–5)	Active defenses (0–2)				
	On patrol: Range from threat (0–3)	Prompt potency (0–8) (inverse scoring)	Variety of weapon effects (0–5)	Redirection (0–4)	
Hard-target kill (0–5)	Detection/ engagement (0–3)	Opponent reaction time (0–7)		Fire/hold fire (0–4)	Discernible message (0–7)
	Countermeasures (0–3)			Delivery (0–4)	
Total (0–25)	Total (0–25)	Total (0–25)	Total (0–25)	Total (0–25)	Total (0–25)

### **Close-Based Advanced Short-Range Strike (F-35s)**

Close-based short-range strike fighters generated the highest aggregate weight of ordnance on enemy targets in 30 days. That earned this strike posture a mass multiple of 1.000. Table B.2 shows the scores that resulted from multiplying that number against the other potency subcategories and evaluating the other attributes.

Basing short-range strike fighters close to the opponent generated a potent deterrent threat, but it made those assets highly vulnerable to surprise attack. This is reflected most strongly in the “Range from Threat” and “Flush Time” scores. Although fighters can flush from their bases much more quickly than some other assets (such as submarines in port), it is highly unlikely that any could flush in time to survive a mass raid of SLBMs or MRBMs, given the short flight times of those missiles. The “On Patrol” scores were also low, due to the fact that close basing would place patrols close to the opponent’s defended airspace, exposing fighters to the risk of ambush by the enemy’s fifth-generation fighters or masses of fourth-generation fighters.

Close basing also resulted in low scores on the attribute “Ability to Mitigate Threat of U.S. Surprise Attack.” This was mainly driven by the short “Opponent Reaction Time” and the strike fighters’ high “Prompt Potency”—the ability to reach and put substantial ordnance on opponent targets in a very short time. These subcategories pulled down scores in “Alert Visibility” and “Deployment/Employment Visibility” as well. Although the opponent would be able to detect the presence of strike fighters via multiple sources, their close proximity might make opponent leaders anxious about whether they could process ISR information on U.S. deployment, employment, or alert status quickly enough to support effective defensive decisionmaking.

Other attribute scores were high, reflecting airpower’s inherent flexibility, responsiveness, and ability to signal.

### **Distant-Based Advanced Short-Range Strike (F-35s)**

Moving short-range strike fighters to more distant bases increased their survivability and mitigates the perception of a threat of U.S. surprise attack, but it also reduced their sortie rate from three per day to one per day. That resulted in a mass multiple of one-third of that awarded



**Table B.2**  
**Close-Based Advanced Short-Range Strike (F-35) Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 1.000	On base/in port: Range from threat: 0	Alert visibility: 4	Range of scenarios: 10	Deployment: 3	Level of concern: 9
Range: 1	Time on base/in port: 1			Flush: 2	
Persistent threat: 5	Flush time: 0	Deployment/ employment visibility: 3	Range of profiles: 8	Load change: 3	Threat potency/ credibility: 6
Penetrate defenses: 3	Passive defenses: 1 Active defenses: 1			Weapon reprogramming: 4	
Persistent attack: 5	On patrol: Range from threat: 1	Prompt potency: 2 (inverse scoring)	Variety of weapon effects: 4	Redirection: 4	
Hard-target kill: 5	Detection/ engagement: 1 Countermeasures: 1	Opponent reaction time: 2		Fire/hold fire: 4 Delivery: 3	Discernible message: 4
Total: 19.000	Total: 6	Total: 11	Total: 22	Total: 23	Total: 19

to close-based fighters, or 0.333. Moving fighters back also reduced the persistence with which they could attack enemy targets and reduced their responsiveness to some extent. Table B.3 shows how this change in posture affects scoring across the attributes.

The changes in scores that resulted from this posture change were most notable in the subcategories of “Ability to Minimize U.S. Vulnerability to Surprise Attack.” Moving fighters back boosted the on-base “Range from Threat” score significantly and also increased the “Flush Time” score. The on-patrol scores also went up because basing assets farther away would better facilitate patrolling at ranges with less exposure to surprise attack.

Moving fighters back also increased “Opponent Reaction Time” and reduced “Prompt Potency” significantly, as fighters would have had to traverse longer distances to and from targets. This posture also gave the opponent more time to process ISR information and assess the implications of changes in U.S. deployment and employment patterns and alerts.

Crisis management attribute scores remained the same as in the previous scenario, except that distant-based fighters would not be able to deliver ordnance as quickly, lowering the responsiveness score.

### **Distant-Based Legacy Bombers (B-52s and B-1s) with Standoff Weapons**

The main limiting factor of standoff bomber potency proved to be inventory size. Because JASSMs, JASSM-ERs, and similar weapons are expensive, the Air Force does not expect to have a great number of them available. Given the numbers cited in Air Force planning projections, when the study team assumed maximum load-outs for the standoff bombers used in the scenario, flying one sortie per day, the inventory was exhausted only a few days into the notional conflict. Alternatively, the U.S. force could (and almost certainly would) ration out these weapons over time, reserving them for high-value targets and other purposes for which weaponeers determine they are best suited. Either way, assuming that all weapons are expended, the aggregate weight of ordnance put on targets over 30 days would be the same. When factored against the most robust strike asset in terms of aggregate weight (i.e., close-based short-range strike fighters), the mass multiple awarded

**Table B.3**  
**Distant-Based Advanced Short-Range Strike (F-35) Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.333	On base/in port: Range from threat: 6	Alert visibility: 5	Range of scenarios: 10	Deployment: 3	Level of concern: 9
Range: 1	Time on base/in port: 1			Flush: 2	
Persistent threat: 5	Flush time: 2	Deployment/ employment visibility: 4	Range of profiles: 8	Load change: 2	Threat potency/ credibility: 6
Penetrate defenses: 3	Passive defenses: 1 Active defenses: 1			Weapon reprogramming: 4	
Persistent attack: 3	On patrol: Range from threat: 2	Prompt potency: 6 (inverse scoring)	Variety of weapon effects: 4	Redirection: 4	
Hard-target kill: 5	Detection/ engagement: 2 Countermeasures: 1	Opponent reaction time: 6		Fire/hold fire: 4 Delivery: 2	Discernible message: 4
Total: 5.661	Total: 16	Total: 21	Total: 22	Total: 21	Total: 19

to standoff bombers was 0.140. Table B.4 shows the attribute scores for standoff bombers.

Distant-based standoff bombers had high scores in “Ability to Minimize U.S. Vulnerability to Surprise Attack” for the same reasons that distant-based strike fighters do. Bombers scored even higher than fighters “On Patrol,” mainly because they would likely patrol even farther away from the opponent’s threats than distant-based fighters, because unlike those fighters, they would not penetrate the opponent’s defended airspace to employ weapons.<sup>4</sup>

Where standoff bombers raised concerns, however, was in their capabilities to create “Prompt Potency” and their potential effects on opponent perceptions of the threat of U.S. surprise attack. Were substantial numbers of standoff bombers to patrol close enough to the opponent to fire their weapons, the opponent might fear that they were posturing to salvo-launch standoff weapons in a surprise attack against key coastal air defense installations, command-and-control nodes, or other high-priority targets typically struck at the beginning of a U.S. air campaign. U.S. leaders can mitigate this threat—in fact, they can deliberately *modulate* it—by keeping patrol distances back just far enough to apply measured coercive pressure without convincing opponent leaders that a surprise attack is imminent. However, there is always a risk of miscalculation by either side.

### **Future Distant-Based Penetrating Long-Range Strike (B-X)**

Because the next-generation bomber has not yet been designed, the study used B-2 Spirit specifications to estimate payload capacity. The team assumed that advances in active and passive defenses would make the follow-on bomber somewhat more stealthy and survivable in contested airspace than the B-2 is today (though by no means undetectable or invulnerable) and substantially more survivable than the F-35.<sup>5</sup>

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<sup>4</sup> Given the standoff weapon inventory limitations, the study achieved maximum potency across the force by assigning all standoff weapons to legacy bombers.

<sup>5</sup> The study assumed that the B-X would need about the same amount of support from other assets providing suppression of enemy air defenses and destruction of enemy air defenses as the B-2 would require to penetrate a near-peer competitor’s denied airspace today.

**Table B.4**  
**Distant-Based Legacy Bomber (B-52 and B-1) with Standoff Weapon Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.140	On base/in port: Range from threat: 6	Alert visibility: 5	Range of scenarios: 10	Deployment: 3	Level of concern: 9
Range: 2	Time on base/in port: 1			Flush: 2	
Persistent threat: 5	Flush time: 2	Deployment/ employment visibility: 4	Range of profiles: 8	Load change: 2	Threat potency/ credibility: 6
Penetrate defenses: 4	Passive defenses: 1 Active defenses: 1			Weapon reprogramming: 4	
Persistent attack: 3	On patrol: Range from threat: 3	Prompt potency: 0 (inverse scoring)	Variety of weapon effects: 3	Redirection: 4	
Hard-target kill: 3	Detection/ engagement: 3 Countermeasures: 1	Opponent reaction time: 3		Fire/hold fire: 4 Delivery: 2	Discernible message: 4
Total: 2.380	Total: 18	Total: 12	Total: 21	Total: 21	Total: 19

Given the numbers of penetrating bombers used in the scenario, flying one sortie per day, the aggregate weight of ordnance delivered over 30 days was very close to that achieved by close-based short-range strike fighters. The mass multiple was calculated to be 0.930. Table B.5 shows the attribute scores for future penetrating bombers.

Due to this weapon system's ability to reach deep into the opponent's defended airspace and the persistence it can achieve when each aircraft divvies out its large payload in measured doses against individual targets, it achieved the highest potency score of any strike asset evaluated. It also scored high on the attribute "Ability to Minimize U.S. Vulnerability to Surprise Attack" for the same reasons that other distant-based aircraft do. Its "On Patrol" scores are higher than those of standoff bombers, even though the B-X might be called upon to penetrate hostile airspace (the study team assumed that it would possess the requisite advanced passive and active defenses).

Scores for the attribute "Ability to Mitigate Threat of U.S. Surprise Attack" were somewhat lower than those of distant-based strike fighters because the B-X's advanced stealth capabilities would undoubtedly raise the opponent's anxieties somewhat, even if U.S. leaders were to keep patrols well away from its defended airspace and make every effort to keep them visible (e.g., sending radio signals, opening bomb bay doors, or using other tactics to increase their radar cross sections). Opponents might fear that while some bombers are being kept visible, others could be attacking unseen. However, penetrating bombers, while more difficult to target, are never completely invisible and would probably need support from other, more visible assets to penetrate denied airspace. Postured at distant bases, they would give opponents more decision time than close-based strikers, and they would also take time to move from target to target.

The crisis management attribute scores were comparable to those of other aircraft, except that the B-X's advanced capabilities increased the range of mission profiles it could perform and the variety of weapon effects it could create, earning it a perfect score on the attribute of "Flexibility."

**Table B.5**  
**Future Distant-Based Penetrating Long-Range Strike (B-X) Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.930	On base/in port:	Alert visibility: 5	Range of scenarios: 10	Deployment: 3	Level of concern: 9
Range: 5	Range from threat: 6			Flush: 2	
Persistent threat: 5	Time on base/in port: 1				
Penetrate	Flush time: 2	Deployment/ employment	Range of profiles: 10	Load change: 2	Threat potency/ credibility: 8
defenses: 4	Passive defenses: 1	visibility: 3		Weapon reprogramming: 4	
	Active defenses: 1				
Persistent attack: 4	On patrol:	Prompt potency: 4 (inverse scoring)	Variety of weapon effects: 5	Redirection: 4	
Hard-target kill: 5	Range from threat: 3			Fire/hold fire: 4	Discernible message: 4
	Detection/ engagement: 3	Opponent reaction time: 5		Delivery: 2	
	Countermeasures: 2				
Total: 21.390	Total: 18	Total: 17	Total: 25	Total: 21	Total: 21

### Conventional ICBMs

Several concepts for conventional ICBM basing have been discussed in the open literature. To give this notional system every benefit of the doubt in potency scoring, the study team used the most robust concept it could find, one that proposed a field of 90 missiles. This, of course, would be the limiting factor in terms of aggregate ordnance deliverable in a 30-day scenario, as it would constitute the entire inventory. The team assumed that these missiles could carry payloads comparable in weight to those of Peacekeeper missiles. The resulting mass multiple calculated for this strike system was 0.042. Table B.6 shows the attribute scores for conventional ICBMs.

Conventional ICBMs scored very high in all potency subcategories but one. They would have deep reach into enemy airspace, have strong hard-target kill capabilities (theoretically), and be very difficult to defend against. Ever ready to strike, they would constitute a very persistent threat. However, with the equivalent of only 90 conventional bombs, U.S. forces could not attack with any persistence. More seriously, their mass multiple is so low that their overall potency was calculated to be less than one-25th that of close-based strike fighters.

Conventional ICBMs would be very survivable against conventional surprise attack. Based in hardened silos in CONUS, they would be essentially invulnerable to everything but a preemptive nuclear strike, and the risk of that occurring would be low considering the potency of survivable U.S. nuclear counterstrike capabilities.

On the other hand, although conventional ICBMs scored very low in potency, they would present a substantial risk of U.S. surprise attack. A force of only 90 weapons would be large enough to threaten opponent leaders with a decapitation strike. Due to the lack of alert and deployment visibility and short flight times, the opponent would have very little reaction time.

Turning to crisis management attributes, conventional ICBMs would be very responsive, being predeployed and in constant communication with launch authorities. The only responsiveness deficiency noted was the time it would take to change weapon loads. However,



**Table B.6**  
**Conventional ICBM Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.042	On base/in port: Range from threat: 6	Alert visibility: 1	Range of scenarios: 2	Deployment: 3	Level of concern: 2
Range: 5	Time on base/in port: 0			Flush: 3	
Persistent threat: 5	Flush time: 3	Deployment/ employment visibility: 0	Range of profiles: 2	Load change: 1	Threat potency/ credibility: 1
Penetrate defenses: 5	Passive defenses: 2 Active defenses: 1			Weapon reprogramming: 4	
Persistent attack: 0	On patrol: Range from threat: 3	Prompt potency: 4 (inverse scoring)	Variety of weapon effects: 2	Redirection: 4	
Hard-target kill: 5	Detection/ engagement: 3 Countermeasures: 2	Opponent reaction time: 1		Fire/hold fire: 4 Delivery: 4	Discernible message: 1
Total: 0.840	Total: 21	Total: 6	Total: 6	Total: 23	Total: 4

conventional ICBMs scored poorly in flexibility and ability to signal—in the first case because of the limited number of scenarios, employment profiles, and weapon effects available to this system and in the latter because it is difficult to signal with a weapon that does not move and whose operations are essentially hidden. Another low score in signaling occurred in “Threat Potency/Credibility.” Opponent leaders might doubt whether the United States would fire this kind of weapon at them in a crisis, believing that the flight profile might be indistinguishable from that of a nuclear-armed ICBM.

### **Ballistic Missile Submarines with Conventional SLBMs**

The U.S. Navy’s concept for Prompt Global Strike using conventional SLBMs reportedly envisions loading two missile tubes onto each *Ohio*-class SSBN with conventionally armed Trident missiles or a new missile developed specifically for this purpose.<sup>6</sup> The United States currently keeps one SSBN on patrol in the Pacific Ocean and one on patrol in the Atlantic Ocean at all times. The study team assumed that one of those submarines would be within missile range of the opponent from the onset of the crisis, and U.S. leaders would be able to put a second one on station during the crisis. Calculating the aggregate ordnance deliverable in four warheads, each the weight of what a Trident D-5 missile can deliver, resulted in a mass multiple of 0.002. Table B.7 shows the attribute scores for conventional SLBMs.

The structural stability attribute scores for this system were similar to those for conventional ICBMs. With the equivalent of only four bombs, this system’s potency would be almost negligible. However, that improved the “Ability to Mitigate Threat of U.S. Surprise Attack” score somewhat, because the “Prompt Potency” threat declined with the lack of potency. This system also had a bit more alert visibility, as opponents would probably know when the additional sub is flushed from port.

The crisis management attribute scores also resembled those of conventional ICBMs, except that the flexibility and signaling scores were a bit higher and the responsiveness score was lower. The flexibil-

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<sup>6</sup> “Future Ballistic Missile Projects,” *Jane’s Strategic Weapon Systems*, undated.

**Table B.7**  
**Ballistic Missile Submarine with Conventional SLBM Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.002	On base/in port:	Alert visibility: 2	Range of scenarios: 2	Deployment: 0	Level of concern: 5
Range: 5	Range from threat: 6			Flush: 1	
Persistent threat: 5	Time on base/in port: 3				
Penetrate defenses: 5	Flush time: 3	Deployment/ employment visibility: 0	Range of profiles: 4	Load change: 0	Threat potency/ credibility: 1
	Passive defenses: 0			Weapon reprogramming: 4	
	Active defenses: 1				
Persistent attack: 0	On patrol:	Prompt potency: 6 (inverse scoring)	Variety of weapon effects: 2	Redirection: 2	
Hard-target kill: 5	Range from threat: 3			Fire/hold fire: 4	Discernible message: 1
	Detection/ engagement: 3	Opponent reaction time: 1		Delivery: 3	
	Countermeasures: 3				
Total: 0.040	Total: 22	Total: 9	Total: 8	Total: 14	Total: 7

ity score was higher due to the greater range of profiles possible with a mobile platform. Signaling was higher because flushing subs from port could signal U.S. concern. Responsiveness was lower due to the time it takes to deploy subs on station or redirect them from one patrol area to another.

### **Guided-Missile Submarines with Conventional SLCMs**

The U.S. Navy currently operates four *Ohio*-class submarines configured to launch conventional SLCMs. Each carries 154 Tomahawk Land Attack Missiles (TLAMs). The study team assumed that one of these subs would be at sea in the region at the onset of the crisis and a second could be deployed during the next 30 days. This would bring to bear a threat of 308 SLCMs over the course of the crisis.<sup>7</sup> Given the warhead size on a TLAM, the mass multiple for SLCMs was calculated to be 0.029. Table B.8 shows the attribute scores for conventional SLBMs.

Scores for this system were similar to those of the other two missile systems examined and most resembled those of SLBMs. With 308 weapons available, the potency score was calculated to be ten times that of SLBMs, but still less than one-40th that of close-based strike fighters. The added potency, along with the shortened reaction time that results from having to fire TLAMs from positions relatively close to their targets, translates to a greater threat of U.S. surprise attack.

The SLCM's crisis management attribute scores also resembled those of SLBMs. They are slightly less responsive but more flexible, and they have a greater ability to signal. The lower responsiveness score owes to the fact that they would have to reel in their communication buoy while conducting evasive maneuver, and their patrol areas would put them in or close to coastal waters where the opponent's anti-submarine warfare capabilities might occasionally force them to do so. The higher flexibility scores stem from the greater range of scenarios, employment

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<sup>7</sup> Attack submarines and surface vessels can also launch TLAMs, but for simplicity, the scenario only considered the SSGNs. The study team did not believe that adding the other launchers would have made a significant difference in the potency score, given the small number of missiles in question.

**Table B.8**  
**Guided-Missile Submarine with Conventional SLCM Scores**

Potency	Ability to Minimize U.S. Vulnerability to Surprise Attack	Ability to Mitigate Threat of U.S. Surprise Attack	Flexibility	Responsiveness	Ability to Signal
Mass multiple 0.029	On base/in port:	Alert visibility: 2	Range of scenarios: 5	Deployment: 0	Level of concern: 5
Range: 2	Range from threat: 6			Flush: 1	
Persistent threat: 5	Time on base/in port: 3				
Penetrate defenses: 4	Flush time: 3	Deployment/ employment visibility: 0	Range of profiles: 7	Load change: 0	Threat potency/ credibility: 6
	Passive defenses: 0			Weapon reprogramming: 3	
	Active defenses: 1				
Persistent attack: 1	On patrol:	Prompt potency: 3 (inverse scoring)	Variety of weapon effects: 3	Redirection: 2	
Hard-target kill: 3	Range from threat: 2			Fire/hold fire: 3	Discernible message: 1
	Detection/ engagement: 2	Opponent reaction time: 0		Delivery: 3	
	Countermeasures: 2				
Total: 0.435	Total: 18	Total: 5	Total: 15	Total: 12	Total: 12

profiles, and weapon effects possible with cruise missiles versus conventional ballistic missiles. The higher signaling score owes entirely to the high “Threat Potency/Credibility” score awarded to these weapons. The United States has used them liberally in the last several conventional engagements. Future opponents will not likely doubt that it would use them again.



## Case-Study Methodology and Data

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This appendix provides more detailed information on the case-study analysis presented in Chapter Four. It explains how the historical cases were selected and analyzed. Table C.1 then presents the raw data collected in the survey of the 48 cases examined in the study.

### Case Selection and Analysis Methodology

#### Case Selection Methodology

Case selection for this examination began with a database of crises that the International Crisis Behavior Project maintains at the University of Maryland. That database catalogs 412 international crises between 1918 and 1994, 305 of which occurred after World War II.<sup>1</sup> Most of the cases in that collection are irrelevant to the factors examined in this study because they involved very low-level confrontations and individual battles during wars or protracted struggles. Also, many of the crises listed in the database were confrontations between small, developing nations that did not have strike forces.

In an effort to filter the sample to a manageable number of relevant cases without “cherry-picking” them to support the propositions

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<sup>1</sup> For a list of the 412 cases and an explanation of how they were selected, see Michael Brecher and Jonathan Wilkenfeld, *A Study of Crisis*, Ann Arbor, Mich.: University of Michigan Press, 1997. For more on the International Crisis Behavior Project and other databases maintained at the University of Maryland, see Center for International Development and Conflict Management (2012).



being tested, the team devised a simple, objective criterion for case eligibility. Only crises in which at least one participant was among the six states identified as having the greatest aggregate combat power in the world as of 2011 were used.<sup>2</sup> This criterion ensured that the states in each confrontation were sufficiently developed to possess and brandish strike assets and that each crisis was serious enough to merit consideration. The states included were Britain, China, France, India, Russia (or the Soviet Union), and the United States.

This generated a base list of 33 cases to which the team added 13 more crises involving those states that occurred from 1995 to 2010. Finally, because the 1967 Arab-Israeli crisis and 1973a Yom Kippur crisis so clearly demonstrated the instability that results from close-basing potent strike assets, those two were added to the list even though they failed to meet the “state power” case selection criterion. These admittedly cherry-picked cases were used for illustrative purposes. They were included in data counts but not in any calculations to determine statistical significance. This completed the final list of 48 cases discussed in Chapter Four.

### Case Analysis Methodology

With the relevant cases identified, the study team coded each one according to the following criteria:

- what strike assets, if any, each opponent had based within striking range of the other opponent
- whether each opponent’s strike assets were safe from surprise attack during the crisis
- what strike assets, if any, each opponent brandished during the crisis or employed if the crisis resulted in war

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<sup>2</sup> Of course, states considered to have the greatest aggregate combat power in 2011 are not necessarily the same states that held that status throughout the period examined (1946–2010). Nevertheless, the six most powerful states in 2011 were all significant powers throughout most of that period, and those that were weak in the beginning aspired to become great powers. Therefore, they acquired long-range strike capabilities early in their emergence. The source used for rating state power was “Comparative Major Defense Statistics,” *The Military Balance*, Vol. 111, No. 1, March 7, 2011, p. 34.

- whether the crisis ended in stability or war
- which opponents were favored in the outcomes of stabilized crises or were victorious in wars.

After the cases were coded, the study team examined the data for relationships between strike system postures and the outcomes of crisis management, coercive diplomacy, and war.

It is important to acknowledge from the outset that this kind of analysis does not capture many of the elements relevant to the cause and resolution of international crises. The analysis did not examine such important factors as forms of government, political ideologies, historical grievances, leadership styles, or relative stakes in the issues in question. Every crisis is unique, and in some of the cases reviewed, elements not considered might have had a greater effect on the outcomes than those examined. Nonetheless, a broad survey of cases such as this one can identify trends that illuminate relationships between the factors of interest. The trends identified in this analysis are sufficiently strong that those relationships are meaningful and important.

## **Raw Data**

Table C.1 presents the raw data collected on the full set of historical cases (1946–2010) examined in this study.

**Table C.1**  
**Historical Cases, 1946–2010**

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Yugoslavia 1946	Crisis	Yugoslavia: Stop U.S. overflight	Yak-7s, Yak-9s, IL-2s, but none brandished	No	USA: Restore safe overflight	B-29s deployed to Germany and flown over Yugoslavia	Yes	Stabilized
Kashmir 1947–1949	Crisis	Pakistan: Seize Kashmir	Hawker Tempests, but not brandished or employed	No	India: Deny Pakistan control of Kashmir	Hawker Tempests, but not brandished or employed	No	War
Berlin 1948–1949	Crisis	USSR: Force Western powers out of West Berlin	Bombers and strike aircraft in East Germany, but not brandished	No	USA: Resist compellence and deter escalation	B-29s deployed to Britain	Yes	Stabilized
Korea 1950a	Crisis	North Korea: Conquer South Korea	IL-10s and Yak-9Ps used in the attack	Yes	South Korea: Deter/defeat invasion	L-4s, L-5s, T-6s, to drop hand grenades	No	War
Korea 1950b	Crisis	PRC: Defend North Korea	MiG-15s, but not used for ground attack south of the Yalu	No	USA: Reunify Korea	Bombers and fighter-bombers engaged in Korea	Yes	War

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Bomber Deployment 1951	Signaling	PRC/USSR: Exploit U.S. preoccupation in Korea (presumed)	PRC strike aircraft, Soviet bombers and strike aircraft, but none brandished	No	USA: Deter communist exploitation	B-29s deployed to Britain and Guam	Yes	—
Taiwan Strait 1954	Crisis	PRC: Drive ROC forces off islands	MiG-15s, but not employed	No	USA: Compel end to attacks	CSG deployed; atomic threats made	Yes	Stabilized
Suez 1956a	Crisis	Egypt: Nationalize the Suez Canal	IL-28 bombers, Meteor and Vampire attack aircraft	No	Israel, Britain, France: Regain control of the Suez Canal and neuter Egyptian military power	Israeli Dassault Mystère, Ouragan, Meteor, F-51, Mosquito aircraft; British and French strike aircraft deployed to Malta and Cyprus; French CSGs deployed to area	Israeli: No Britain, France: Yes	War
Suez 1956b	Crisis	Israel, Britain, France: Exploit gains against Egypt	Israeli, French, and British aircraft postured against Egypt	Israel: No Britain, France: Yes	USA, USSR: Compel Israel, Britain, and France to end conflict	USSR threatened rocket attacks on Britain, France, and Israel	Yes	Stabilized

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Taiwan Strait 1958	Crisis	PRC: Drive ROC forces off islands	MiG-15s, J-5s, but not employed	No	USA: Compel end of attacks	Strike aircraft deployed to Taiwan; CSG deployed to region; B-47s on Guam put on alert	Yes	Stabilized
Berlin 1961	Crisis	USSR: Curtail civilian defection from East Berlin	Multiple bombers and strike aircraft in East Germany and Eastern Block, but none brandished	Yes (dispersal)	USA: Deter escalation	Numerous tactical strike aircraft mobilized and deployed to Europe	Yes (massive retaliation)	Stabilized
Sino-Indian 1962	Crisis	PRC: Punish Indian border incursions	J-5s, but not brandished or employed	No	India: Force favorable resolution to border dispute	B-24, B-57, HF-24, Tempest, Mystère IV, Ouragan aircraft, but none brandished or employed	No	War

**Table C.1—Continued**

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Cuba 1962	Crisis	USSR: Base nuclear-armed missiles in Cuba	MRBMs in Cuba; no other Soviet forces put on alert	No, but MAD	USA: Compel missile withdrawal and deter escalation	Bombers airborne, strikers dispersed and put on alert, ICBM and SLBM forces put on alert	Yes	Stabilized
Kashmir 1965	Crisis	Pakistan: Seize Kashmir	B-57s, F-86s	No	India: Deny Pakistan control of Kashmir	B-57s, Hawker Hunters, Vampires	No	War
Arab-Israeli 1967	Crisis	Egypt, Iraq, Jordan, Syria: Destroy Israel or retake territories lost in earlier wars	IL-28s, TU-16s, Hawker Hunters, Meteors, SU-7s	No	Israel: Defend and expand territory	Meteor, Mirage IIIC, Mystère IV, Super Mystère B2 aircraft	No	War
EC-121 Shootdown 1969	Crisis	North Korea: Interdict U.S. reconnaissance	H-5s, A-5s, SU-7s, but none brandished or employed after the shootdown	No	USA: Conduct reconnaissance in international airspace	F-4s and F-106s in Japan and Korea, but none brandished or employed	Yes	Stabilized
Sino-Soviet 1969	Crisis	PRC: Force favorable resolution of border dispute	H-6s, J-6s, but none brandished or employed	No	USSR: Defeat PRC border incursions	Missiles and new airbases near border; nuclear threat	Yes (nuclear)	Stabilized

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Bomber Deployment 1969	Signaling	USSR: Continue support for North Vietnam	Tu-95s, M-Types, multiple strike aircraft, ICBMs, but none brandished	Yes (MAD)	USA: Communicate resolve in Vietnam War	B-52s deployed to Alaska and patrolling Soviet border; missile forces also put on alert	Yes (MAD)	—
<i>Pueblo</i> Incident 1968	Crisis	North Korea: Seized USS <i>Pueblo</i>	H-5s, A-5s, SU-7s, but none brandished or employed	No	USA: Rescue or compel the release of ship and crew	B-52s and F-105s in Japan; F-4s and F-106s to Korea	Yes	Stabilized
Black September 1970	Crisis	Syria: Defeat Jordanian effort to drive out PLO	SU-22; President Assad ordered aircraft grounded	No	Jordan, USA: Compel Syrian withdrawal	Jordanian employed Hawker Hunter; U.S. CSG deployed to eastern Mediterranean	Yes	Stabilized
Bangladesh 1971	Crisis	Pakistan: Defeat East Pakistani independence effort	B-57s, H-5s, F-6s, F-86s; conducted preemptive strike	No	India: Support East Pakistani independence	B-57s, HF-24s, SU-7s; some strike may have deployed forward	No	War

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Yom Kippur 1973a	Crisis	Egypt, Iraq, Syria: Regain territory and “face”	IL-28s, TU-16s, Hawker Hunters, Meteors, SU-7s, SU-20s	No	Israel	F-4s, Mirage IIICs, Super Mystère B2s, Nesheers	No	War
Yom Kippur 1973b	Crisis	USSR: Prevent Israel from defeating Syria	Soviet ambassador stated that Israeli population would not remain safe from attack	Yes (MAD)	USA: Deter Soviet intervention and ensure survival of Israel	DEFCON 3; B-52s deployed from Guam to CONUS; CSG deployed to eastern Mediterranean	Yes (MAD)	Stabilized
Belize 1975	Crisis	Guatemala: Annex British Honduras/Belize	A-37s, but not brandished and unsuitable for offensive counter-air operations	No	Britain: Establish sovereign independence of Belize	Harriers deployed to Belize	Yes	Stabilized
Poplar Tree Incident 1976	Crisis	North Korea: Unknown	H-5s, A-5s, SU-7s, but none brandished or employed	No	USA: Deter further aggression	Deployed B-52s, F-111s and CSG; B-52s and USAF fighters flew show of force close to DMZ	Yes	Stabilized



Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Sino-Vietnamese 1979	Crisis	PRC: Punish Vietnam for occupation of Cambodia	TU-16/H-6s, Q-5s, but not brandished or employed	Yes	Vietnam: Deter/defeat PRC incursion	IL-28s, MiG-19/J-6s, MiG-21s, SU-7s, A-1s, F-5s, but not brandished or employed	No	War
Iran 1979–1980	Signaling	USSR: Invade Iran or exploit Islamist revolution	Multiple bomber and strike aircraft types but none brandished	Yes (MAD)	USA: Deter Soviet exploitation	B-52s patrolling over Black Sea	Yes (MAD)	
Falklands/Malvinas 1982a	Crisis	Argentina: Seize the islands	B-57s, A-4s, Daggers, Mirage IIIEAs, Super Entendars	Yes	Britain: Retain sovereignty over the islands	None	—	War
Falklands/Malvinas 1982b	Crisis	Britain: Retake the islands	Vulcan Mk2s, Harriers	Yes	Argentina: Retain sovereignty over the islands	B-57s, A-4s, Daggers, Mirage IIIEAs, Super Entendars	Yes	War
Grenada 1983	Crisis	USA: Regime change	F-4s, A-7s, A-6s, AC-130s, helicopter gunships	Yes	Grenada, Cuba: Deter/defeat U.S. attack	None	—	War

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Panama 1989–1990	Crisis	USA: Regime change	F-117s, AC-130s, helicopter gunships	Yes	Panama: Deter/defeat U.S. attack	None	—	War
Iraq 1990	Crisis	Iraq: Seize oil-rich territory	TU-16s, Mirage F1s, MiG-23s, SU-20s, SU-22s, SU-24s, SU-25s; SCUDs deployed to firing positions	Aircraft: No Missiles: Yes	USA: Deter aggression into Saudi Arabia	Strike assets deployed to region; B-52s deployed to Diego Garcia; SLCM-armed subs and CSGs deployed	Yes	Stabilized
Iraq 1991	Crisis	U.S.-led coalition: Compel withdrawal from Kuwait and hobble Iraqi power	Strike assets deployed to region; B-52s deployed to Diego Garcia; SLCM-armed subs and CSGs deployed	Yes	Iraq: Deter/defeat U.S.-led coalition	TU-16s, Mirage F1s, MiG-23s, SU-20s, SU-22s, SU-24s, SU-25s; SCUDs deployed to firing positions	Aircraft: No Missiles: Yes	War
North Korean Nuclear 1993–1994	Crisis	North Korea: Develop nuclear weapons	H-5s, A-5s, SU-7s, SU-25s, but none brandished	No	USA: Encourage NPT compliance	F-16s in Korea and Japan, but none brandished	Yes	Stabilized

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Iraq 1994	Crisis	Iraq: Threaten Kuwait with force deployments	Mirage F1s, MiG-23s, SU-20s, SU-22s, SU-24s, SU-25s, but none brandished	No	USA: Deter Iraqi aggression on Kuwaiti border	CSG deployed; A-10s and F-16s deployed	Yes	Stabilized
Bosnia 1995	Crisis	Bosnian Serbs: Defeat Bosnian and Croat forces	None	—	NATO: Compel Serbian forces to end aggression in Bosnia	F-15Es, F-16s, F-18s, Jaguars, Mirages, other allied strike aircraft postured and employed; TLAMs also eventually employed	Yes	Stabilized
Taiwan Strait 1995–1996	Crisis	PRC: Intimidate Taiwanese voters	Conventional missiles launched near Taiwan; J-7s and J-8s deployed opposite Taiwan	Yes	USA: Compel PRC to end intimidation of Taiwanese voters	2 CSGs deployed to Taiwan Strait; Nimitz CSG transited the strait	No	Stabilized

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Iraq 1999	Crisis	USA, Britain: Reduce Iraqi capabilities; compel compliance with UN inspections	Bombers, strike aircraft, standoff air-launched cruise missile, and TLAM postured and employed	Yes	Iraq: Obstruct UN inspections	Mirage F-1s, SU-20/22s, SU-24s, SU-25s	No	War
Kargil 1999	Crisis	Pakistan: Gain control of disputed territory	A-5, F-6, F-7, F-16, Mirage III, Mirage 5; none brandished or employed	No	India: Retain control of disputed territory	MiG-21s, MiG-29s, Mirage IIIs, not brandished but employed later	No	War
Kosovo 1999	Crisis	NATO: Compel Serbia's acceptance of Rambouillet Accords	B-2s sortied from CONUS; other bombers deployed to Britain; numerous short-range strike assets already in theater; SLCM-armed subs and CSGs deployed as conflict progressed	Yes	Serbia: Resist compellent demands; deter/defeat attack	G-4s, J-22s, but none used for attack	No	War

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Hainan Incident 2001	Crisis	PRC: Save face after J-8 collision with U.S. Navy P-3	H-6s, JH-7s, Q-5s, J-10s, J-11s, SU-30s, but none brandished	Yes	USA: Safe return of aircraft and crew	None in the region; none deployed	—	Stabilized
Indo-Pakistani 2001	Crisis	Pakistan: Terrorist attack on Indian Parliament	Air units put on alert; missile tested; nuclear threats	Yes (nuclear)	India: Respond forcefully to deter further attacks	Air and missile units put on alert	Yes (nuclear)	Stabilized
Iraq 2003	Crisis	U.S.-led coalition: Regime change	B-2, B-1, B-52, numerous land- and carrier-based strike aircraft, SLCMs	Yes	Iraq: Deter/defeat coalition attack	MiG-23s and SU-25s grounded	No	War
North Korean Nuclear 2003	Crisis	North Korea: Establish existence of a nuclear deterrent	H-5, A-5, SU-7, SU-25; posture unknown	Yes (dispersal, hardening)	USA: Compel return to NPT	CSG deployed; 24 B-52 and B-1 bombers deployed to Guam	Yes	Stabilized
Korean Missile Crisis 2006–2007	Crisis	North Korea: Strengthen deterrence	Test missiles postured and launched; postures of H-5s, A-5s, SU-7s, SU-25s unknown	Yes (dispersal, hardening)	USA: Deter further testing	B-2s, B-1s, and B-52s to Guam; F-22s to Alaska	Yes	Stabilized

Table C.1—Continued

Case	Type	State(s) A and Objective	Strike Assets Postured	Safe from Surprise Attack?	State(s) B and Objective	Strike Assets Postured	Safe from Surprise Attack?	Outcome
Georgia 2008	Crisis	Georgia: Reestablish control over Abkhazia and South Ossetia	SU-25s, L-29s employed	No	Russia, Abkhazia: Defend Abkhazian/South Ossetian autonomy	SU-24s, SU-25s, SU-27s postured in nearby bases then employed; TU-22s employed from home bases	Yes	War
Indo-Pakistani 2008	Crisis	Pakistan: Terrorist attack on Mumbai hotel	F-7s, F-16s, J-10s, JF-17s, Mirage IIIs, Mirage 5s; nuclear-capable SRBMs, MRBMs, IRBMs, cruise missiles; none brandished	Yes (nuclear)	India: Compel Pakistani cooperation in investigation and to restrain further attacks	Jaguar IS/IMs, MiG-27s; Mirage 2000s, SU-30s; nuclear-capable SRBMs, MRBMs, IRBMs, cruise missiles; none brandished	Yes (nuclear)	Stabilized
Yomp'yong-do 2010	Crisis	North Korea: Unknown. Possibly to demonstrate power in preparation for leadership transition	H-5s, A-5s, MiG-23s, SU-7s, SU-25s; SRBMs, MRBMs, and IRBMs; MiG-23s deployed south; surface standoff missiles put on alert	Yes (dispersal, hardening)	USA, South Korea: Prevent escalation; deter further aggression	F-16s and F-15Ks scrambled; CSG deployed to North Korean coast; Republic of Korea strike deployed close to border	USA: Yes South Korea: No	Stabilized

NOTE: DMZ = demilitarized zone. NPT = nonproliferation treaty. PLO = Palestinian Liberation Organization. ROC = Republic of China (Taiwan). — = not applicable.



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Crisis stability and the means of maintaining it, crisis management, were central concerns in the Cold War. They are becoming relevant again as nuclear proliferation and the reemergence of great power competitors make dangerous interstate confrontations increasingly likely. When managing an international crisis, U.S. leaders will need to defuse the threat of war without compromising important political or military interests, and they will want to do so before tensions escalate to the point at which one or both sides resort to nuclear brandishing. In such situations, the United States must balance its threats with restraint. It must posture forces in ways that deter aggression without implying that an attack is imminent, while limiting its own vulnerability to surprise attack. These seemingly contradictory requirements put peculiar demands on force structure. Long-range strike assets—strike fighters, bombers, ballistic missiles, and cruise missiles—play an important role in crisis management, but are any of these systems more conducive to crisis stability than others and, if so, why? To answer these questions, a RAND study examined the potential effects of alternative long-range strike systems on crisis stability, with a particular focus on specific attributes: potency, ability to minimize U.S. vulnerability to surprise attack, flexibility, responsiveness, and ability to convey the desired message in the event of an international crisis.



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